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ATTENTION: Gloria Hale

Art Unit 3765

Regarding: **NEW PATENT APPLICATION 10/713,686**

Sesselmann, Gregory J.

Enclosed is notice of prior art for your review.

1. Military spec describing how to make carbon fabric. (January 16, 1986) ss(1981)

- 2. Military spec describing how to build a carbon based desert camouflage carbon suit. (March 28, 1986) ss(1984)
- 3. Military spec describing how to build a carbon based woodland camouflage carbon suit. (August 30, 1991) ss(1988)
- **4.** Government chemical carbon suits sold for hunting made in the 1980's. Google Search: "chemical suits + hunting"

Consumer forum discussing chemical suits.

*Note-These government issue carbon suits are sold to hunters on Ebay along side ALS Scent Lok suits (Sesslemann). They can't be removed from the market because they are prior art.

5. Ad for scent control powder containing "Zeolite" Abscent crystals. Nov. 1991

MIL-C-43858B(GL)
16 January 1986
SUPERSEDING
MIL-C-43858A(GL)
17 September 1981

MILITARY SPECIFICATION

CLOTH, LAMINATED, NYLON TRICOT KNIT, POLYURETHANE FOAM

LAMINATE, CHEMICAL PROTECTIVE AND FLAME RESISTANT

This specification is approved for use by Natick Research, Development and Engineering Center, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

- 1.1 <u>Scope</u>. This document covers three types of tricot knit nylon cloth laminated to polyurethane foam and impregnated with an activated carbon mixture.
- 1.2 Classification. The cloth shall be of the following types as specified (see $6.\overline{2}$).

Type I -Chemical protective

Type II -Chemical protective and flame resistant

Type III -Chemical protective (special finish)

2. APPLICABLE DOCUMENTS

2.1 Government documents. Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this document to the extent specified herein:

SPECIFICATION

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development and Engineering Center, Natick, MA 01760-5014, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter

AMSC N/A

FSC 8305

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FEDERAL

PPP-P-1136 - Packaging of Coated (Plastic; Rubber) and Laminated Fabrics

STANDARDS

FEDERAL

FED-STD-191 - Textile Test Methods

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3574 - Flexible Cellular Materials, Slab, Bonded, and Molded Urethane Foams

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

- 2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document shall take precedence.
 - 3. REQUIREMENTS
- 3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.3).
 - 3.2 Materials.
- 3.2.1 Base cloth. The base cloth shall be tricot knit nylon knitted on a 28 gauge tricot machine using 40 denier nylon yarn. The cloth shall

approximate color Olive Green 106 or black, and shall show "good" fastness to water. The cloth shall also meet the physical requirements specified in table I when tested as specified in 4.4.1.1.

TABLE I. Physical requirements of base cloth

	Requ	irement
Characteristic	Minimum	Maximum
Weight, ounce/square yard	1.8	2.2
Yarns per inch: Wales/inch Courses/inch	37 35	-
Bursting strength, pounds:	75	-

3.2.2 Polyurethane foam. The foam to be adhered to the base cloth shall be an unpigmented polyester based polyurethane flame laminable foam meeting the physical requirements in table II when tested as specified in 4.4.1.1.

TABLE II. Physical requirements of polyurethane foam

	Requirement		
Characteristic	Minimum	Maximum	
Thickness, inches	0.089	0.109	
Density, pounds/cubic foot	-	2.0	
Tear, pounds/inch	3.0	· -	
Compression set, percent	-	25.0	

3.2.3 Impregnating mixtures.

- 3.2.3.1 Type I. The impregnating mixture for type I cloth shall be a carbon slurry consisting of activated carbon in water with other ingredients to bind the carbon to the polyurethane (see 6.4 and 6.4.1.1).
- 3.2.3.2 Type II. The impregnating mixture for type II cloth shall consist of activated carbon and 4 percent Phos Chek^R P-30 in water with other ingredients to bind the carbon to the polyurethane (see 6.4 and 6.4.1.2).

3.2.3.3 Type III. The impregnating mixture for type III cloth shall consist of activated carbon (see 6.4 and 6.4.1.3) and Polyoz WSRN-80^R and Phos Check^R P-30 in water with other ingredients to bind the carbon to the polyurethane. The impregnating compound shall be made up of formulations A and B, mixed together in the quantities specified in formulation C to attain an approved impregnation compound. The final composition (formulation C) shall be applied to the cloth within 48 hours after preparation (see 4.4.1.2).

Impregnating mixture for type III cloth

Formulation A 1/	Percent (by	wt.)	
Activated carbon Dispersing agent (18% solids) Water Thickener (28% solids) 5% solution Binder (38% solids)	35.0 5.0 29.0 25.0 <u>6.0</u> 100.0		
Formulation B 2/	Percent (by	wt.)	
Polyox WSRN-80 ^R $\frac{3}{4}$ Phos Chek ^R P-30 $\frac{3}{4}$ Water	4.5 36.0 59.5 100.0		
Formulation C 4/	Percent (by wt.)	Wt. (1bs.)	
Formulation A (Carbon slurry - 40% solids)	70.0 .	315	
Formulation B (Polyox WSRN-80 ^R and Phos Chek ^R P-30)	11.0	50	
Water	$\frac{19.0}{100.0}$ 5/	85 450	

^{1/} Carbon slurry (see 6.4.1).

Preparation of formulation B. The Polyox WSRN-80^R solution shall be prepared first and the Phos Chek^R P-30 added to the Polyox WSRN-80^R suspension. The required amount of Polyox WSRN-80^R shall be placed in 2/3 the amount of required water with high speed stirring to dissolve the Polyox WSRN-80^R completely. The Phos Chek^R P-30 and the remaining water shall then be added slowly with high speed stirring to disperse the Phos Chek^R P-30 in the Polyox WSRN-80^R solution.

- 3/ See 6.4.1.6.
- 4/ Preparation of formulation C. Small quantities of formulation B and water shall be added simultaneously into formulation A with high speed stirring to insure a uniform dispersion. Batch size may vary at the contractor's option.
- 5/ The amount of water may be decreased as needed to obtain the required laminated cloth weight.
- 3.3 Assembly and treatment of the cloth.
- 3.3.1 Bonding of base cloth to foam. Prior to impregnation, the polyurethane foam shall be flame laminated to the float side of the nylon knit base cloth. The cloth/foam laminate shall meet the following flexibility and thickness requirements when tested as specified in 4.4.1.1.

•	Requi	rement
Flexibility:	Minimum	Maximum
Wales, load pounds	•	0.010
Courses, load pounds	-	0.010
Thickness (inches)	0.070	0.094

- 3.3.2 <u>Impregnation</u>. When type I, II, or III is specified, the impregnating compound specified in 3.2.3.1, 3.2.3.2, or 3.2.3.3, as applicable, shall be applied to the laminated cloth by a pad-dry procedure. The padding of the dispersion shall be done at room temperature by passing the cloth through squeeze rolls and then drying the cloth (see 6.4.2). Control minimum shrinkage by overfeed prior to impregnation and minimum pin frame tension during oven drying (see 6.4.2).
- 3.4 <u>Finished cloth</u>. The finished cloth (impregnated cloth/foam laminate) shall meet all the physical requirements in table III when tested as specified in 4.4.3.

TABLE III. Physical requirements of finished cloth

Characteristic	Type I	Requireme Type II	ent Type III
Weight, ounces/square yard:			
Minimum	7.0	9.0	7.5
Maximum	9.5	10.0	10.0
Thickness, inches:			
Minimum	0.070	0.090	0.070
Maximum	0.110	0.120	0.120
Air permeability, cubic feet/minute/square foot			
(minimum)	40	40	40
Bursting strength, pounds (minimum)	75	75	75
Carbon tetrachloride absorption,			
mg/cm ² (minimum)	1.8 1/	$1.2 \ \underline{2}/$	1.8 <u>1</u> /
Flexibility-load pounds (maximum) 60° angle:			
Wales	0.050	0.065	0.065
Courses	0.030	0.045	0.045
Flame resistance, vertical:			
After flame, wales and courses direction,			
seconds (maximum)	-	4.0	_
After glow, wales and courses direction,			
seconds (maximum)	-	6.0	_
Char length, wales and courses direction,			
inches (maximum)	-	6.0	-
Water resistance, mL (maximum)	-	-	50 <u>3</u> /

^{1/} No individual specimen test result shall be less than 1.6 mg/cm².

²/ No individual specimen test result shall be less than 1.0 mg/cm².

³/ Maximum amount of water penetrating the sample within a 5 minute period.

- 3.5 <u>Length and put-up</u>. The finished cloth shall be put up in rolls 35 to 110 yards in length. No piece in a roll shall be less than 10 yards in length. No more than one splice per roll is permitted.
- 3.6 Width. The width of the finished cloth between clip marks shall be 50 to 60 inches.
 - 3.7 Surveillance marking.
- 3.7.1 Lot number marking. Each roll from each lot of finished cloth shall be identified with a specific lot number consisting of the following code in the designated format:

AB
$$1/$$
 - CDOEF $2/$ - 000000 $3/$

- 1/ First two letters of the fabric impregnator's company name, using capital letters.
- 2/ Applies to type III cloth only.
 - A. First two letters of the formulation "C" mixer's company name.
 - B. The middle zero shall designate the daily batch number (1-9).
 - C. First two letters of the formulation "B" mixer's company name.
- 3/ Date
 - A. First two zeros shall indicate day of fabric impregnation.
 - B. Middle two zeros shall indicate month of fabric impregnation.
 - C. Last two zeros shall indicate year of fabric impregnation.

Labels on which the lot number is marked shall be securely attached to each roll of impregnated laminated cloth.

- 3.7.2 <u>Lotting</u>. The lot of finished cloth is defined as the number of yards of laminated cloth impregnated in no more than one day. For type III cloth, the lot shall also consist of only that cloth impregnated using one batch of formulation "C" and formulation "C" shall only contain one mixture of formulation "B".
- 3.8 Color. The color of the finished cloth shall be a suitable shade of black.
- 3.9 Workmanship. The finished cloth shall conform to the quality of product established by this document. The occurrence of defects shall not exceed the applicable acceptable quality levels.
 - 4. QUALITY ASSURANCE PROVISIONS

- 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.
- 4.1.1 <u>Certificate of compliance</u>. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.
- 4.2 <u>Classification of inspection</u>. The inspection requirements specified herein are classified as follows:
 - a. First article inspection (see 4.3).
 - b. Quality conformance inspection (see 4.4).
- 4.3 First article inspection. When a first article is required (see 6.2), it shall be examined for the defects specified in 4.4.2.1 and 4.4.2.2, and tested for the characteristics specified in 4.4.3. The presence of any defect or failure of any test shall be cause for rejection of the first article.
- 4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.
- 4.4.1 <u>Component and material inspection</u>. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.
- 4.4.1.1 Component testing. In addition to the quality assurance provisions of applicable subsidiary documents, testing shall be performed on components and materials listed in table V for the characteristics shown. Test methods cited shall be in accordance with FED-STD-191 except where otherwise specified. The sample units for the base cloth, the polyurethane foam, and the cloth/foam laminate (prior to impregnation) shall be 3 continuous yards each full width. The sample size (number of sample units) shall be as specified in table IV. The lot shall be unacceptable if one or more sample units fail to meet any requirement specified. All test reports shall contain the individual values utilized in expressing the final results.

TABLE IV. Sample size

Lot size (yards)	Sample size (No. of sample units)
800 or less	2
801 up to and including 22,000	3
22,001 and more	5

TABLE V. Component tests

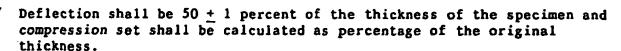
Characteristic	Rqmt. para.	Test method	No. deter. per sample unit	Results reported as
Knit	3.2.1	1/	-	-
Gauge	3.2.1	<u>1</u> /	-	-
Yarn denier	3.2.1		-	-
Colorfastness to water	3.2.1	5630	_	Pass or fail
Weight	3.2.1	5041	5	Nearest 0.1 oz.
Yarns per inch	3.2.1	5070	5 each direction	Whole number
Bursting strength	3.2.1	5120	5	Nearest 1 lb.
Composition	3.2.2	<u>1</u> /		-
Thickness	3.2.2	ASTM D-3574 2/	3	Nearest 0.001 in
Density	3.2.2	ASTM D-3574	1	Nearest 0.1 lb./ ft.3
Tear	3.2.2	ASTM D-3574 <u>2</u> /	3	Nearest 0.1 lb./ in.
Compression set	3.2.2	ASTM D-3574·3/	3	Nearest 0.1 per- cent
Compositon			-	-
	Knit Gauge Yarn denier Colorfastness to water Weight Yarns per inch Bursting strength Composition Thickness Density Tear Compression set	Knit 3.2.1 Gauge 3.2.1 Yarn denier 3.2.1 Colorfastness 3.2.1 to water Weight 3.2.1 Yarns per inch 3.2.1 Bursting 3.2.1 Strength Composition 3.2.2 Thickness 3.2.2 Density 3.2.2 Compression 3.2.2 Composition 3.2.2 Tear 3.2.2 Composition 3.2.2 And	Knit 3.2.1 1/2 Gauge 3.2.1 1/2 Yarn denier 3.2.1 5630 Colorfastness 3.2.1 5630 to water 3.2.1 5041 Yarns per inch 3.2.1 5070 Bursting 3.2.1 5120 strength 3.2.2 ASTM D-3574 2/2 Density 3.2.2 ASTM D-3574 2/2 Compression 3.2.2 ASTM D-3574 3/2 Compression 3.2.2 ASTM D-3574 3/2 Compositon 3.2.3.1 1/3.2.3.2 3/2 and 3.2.3.2 3/2 3/2	Rqmt. per sample unit

TABLE V. Component tests (cont'd)

Component	Characteristic	Rqmt. para.	Test method	No. deter. per sample unit	Results reported as
Cloth/foam laminate (prior to	Flexibility	3.3.1	5202	5 each direction	Nearest 0.001 pound
impregna- tion)	Thickness	3.3.1	4.5.1	5 .	Nearest 0.001 inch

^{1/} Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirement.

^{2/} Except that the test specimen shall be a piece of foam 2 inches by 6 inches in the thickness supplied. A slit 2 inches long shall be cut in one end of the specimen parallel to the long dimension to form two 1-inch wide legs which shall be gripped in opposite jaws of the testing machine. Thickness shall be measured with a dial gage with a 20-square inch foot area (minimum) and a foot pressure of 0.010 pounds per square inch.



4.4.1.2 <u>Certification (type III)</u>. A certificate of compliance shall be furnished with each lot of cloth stating that the cloth was processed or finished with the impregnating compound (formulation C) within 48 hours after the compound was prepared (see 3.2.3.3).

4.4.2 End item examination.

4.4.2.1 Yard-by-yard examination. The required yardage of each roll shall be examined on both sides for the defects listed below. All defects found shall be counted regardless of their proximity to each other except where two or more defects represent a single local condition, in which case only the more serious defect shall be counted. The sample unit shall be 1 linear yard. The acceptable quality level (AQL), expressed in terms of defects per hundred yards, shall be 2.5 for major defects and 6.5 total (major and minor combined) defects. The inspection level shall be II. The number of rolls from which the sample yardage is to be selected shall be in accordance with table VI. The sample yardage shall be apportioned equally among the selected rolls.

•	Classification	
Defect	Major	Minor
Cloth side		
Color not as specified		x
Hole, cut, tear, mend, run or dropped stitch, or abrasion mark resulting in weak area		
- from 1/2 inch to 1.0 inch in any direction		X
- larger than 1 inch in any direction	x	
Creases or area of delamination	X	
Foreign matter		X
Oil spot or stain		X
Objectionable odor	x	•
Polyurethane foam side		
Cut, tear, void, or repaired section		
- 1/2 inch or less in diameter		х
- over 1/2 inch in diameter	x	
Foreign matter	X	
lough or ragged edges (other than tenter clip marks)	X	
Defective foam splice	x	
Tackiness Tackiness	x	
Ineven distribution of impregnating compound	X	
olyurethane foam does not cover the entire width of the		
knit backing cloth between tenter clip marks	x	

TABLE VI. Sample size

Lot size in yards	Sample size in rolls	Acceptance number $2/$
Up to and including 1200 1/	3	0
1201 to and including 3200	5	Ö
3201 to and including 10,000	8	Ŏ
10,001 to and including 35,000	13	Ō
35,001 to and including 150,000	20	i
150,001 and over	32	2

^{1/} If a lot contains fewer than three rolls, each roll in the lot shall be examined.

 $[\]underline{2}$ / Applicable to length examination defects only (see 4.4.2.2).

4.4.2.2 <u>Length examination</u>. Each roll of cloth used in the yard by yard examination shall be examined for the defects listed below. If the total number of defects in the sample rolls exceeds the applicable acceptance number specified in table VI or if the total of the actual lengths of the sample rolls is less than the total of the lengths marked on the roll tickets, the lot shall be rejected.

Any roll (gross length) less than 35 or more than 110 yards.

Any roll (gross length) more than 2 yards less than gross length marked on ticket.

Any piece less than 10 yards.

More than one splice per roll.

Any roll containing 2 or more pieces unspliced.

Width less than 50 inches or more than 60 inches (between clip marks).

4.4.3 End item testing. The laminated cloth shall be tested for the characteristics indicated in table VII. The methods of testing specified in FED-STD-191 wherever applicable and as listed in table VII shall be followed. The sample unit shall be 3 yards full width of finished cloth. The sample size shall be in accordance with table IV. The lot shall be unacceptable if the lot average for air permeability, if any sample unit test result for any other characteristic, or if any individual carbon tetrachloride specimen result fails to meet the specified requirements. All test reports shall contain the individual values utilized in expressing the final results.

TABLE VII. End item tests

Characteristics	Requirement paragraph	Test method	No. determina- tions per sample unit	Report results to nearest
Weight	Table III	5041	5	0.1 oz./yd. ²
Thickness	Table III	4.5.1	5	0.001 inch
Air permeability	Table III	5450 <u>1</u> /	5	0.1 ft.3/min/ft.2
Bursting strengh	Table III	5120 <u>2</u> /	5	1 pound
Carbon tetra- chloride absorption	Table III	4.5.2 <u>3</u> /	9	0.1 mg/cm ²

TABLE VII. End item tests (cont'd)

Characteristics	Requirement paragraph	Test method	No. determina- tions per sample unit 1/	Report results to nearest
Flexibility	Table III	5202	5	0.001 load pounds
Flame resistance, verticle: After flame	Table III	5903	· 5	0.1 second
(type II only) After glow (type II only)	Table III	5903	5	0.1 second
Char length (type II only)	Table III	5903	5	0.1 inch
Water resistance (type III only)	Table III	5516 <u>4</u> /	5	1 mL

^{1/} Report the lot average.

- 2/ The bursting strength tests shall be made with the specimen placed in the ring clamp nylon tricot knit side up with the foam side of the laminate facing the ball.
- 3/ Testing shall be performed by the Government. Except in cases of dispute, test samples shall be from production dried materials. In case of dispute, samples shall be conditioned in an air circulating oven at $50^{\circ} \pm 2^{\circ}$ C for 16 \pm 0.5 hours and tested while in the conditioned state.
- 4/ Prior to testing, adjust the flow of water so that 800 ± 50 mL will be delivered during a 5-minute test period with no sample in the apparatus. Samples shall be tested foam side up, the hydrostatic head shall be 5 cm and the sample shall be tested for 5 minutes. Water penetrating through the sample shall be collected and measured. Dry upper and lower orifice plate thoroughly between test samples.
- 4.4.4 Packaging inspection. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1136.
 - 4.5 Methods of inspection.
 - 4.5.1 Thickness measurement.

- 4.5.1.1 Test specimen. The specimen shall be a piece of laminated cloth at least as large as the presser foot of the thickness gauge and shall be free of folds, creases, knots or other distortions which are not representative of the material surface. No selvage or cut edge shall be included in the sample tested. The specimens shall be cut from different parts of the full width of the laminated cloth.
- 4.5.1.2 Apparatus. The test apparatus shall be a compressometer with a 20 square inch presser foot (see 6.5).
- 4.5.1.3 <u>Procedure</u>. The compressometer shall be balanced. After balancing, the test specimen shall be placed under the presser foot and the machine set for 0.01 pounds per square inch. The presser foot shall then be lowered and the thickness reading under the above specified pressure shall be recorded.
- 4.5.1.4 Report. Five specimens shall be tested from each sample unit. The result shall be reported as the average of the five specimens tested.
 - 4.5.2 Carbon tetrachloride absorption.
 - 4.5.2.1 Apparatus and reagents.
- 4.5.2.1.1 <u>Vapor generator</u>. Any apparatus can be used that generates a carbon tetrachloride/nitrogen gas mixture which contains a concentration of 5 + 0.5 mg of carbon tetrachloride per liter (see 6.7).
- 4.5.2.1.2 <u>Diluent</u>. Prepurified nitrogen shall be used as the diluent to pass the carbon tetrachloride vapors through the test cups containing the test specimens. The flow through each test cup shall be 1 ± 0.03 liter/minute. The rate of flow can be controlled by the use of either a rotometer or a critical orifice.
- 4.5.2.1.3 Constant temperature cabinet. The constant temperature cabinet shall be large enough to hold the system, as shown in figure 1, and shall be capable of maintaining a temperature of $90^{\circ} + 2^{\circ}F$.
- 4.5.2.1.4 Fabric sample cup. The fabric sample cup shall conform to the requirements shown in figure 2.
- 4.5.2.1.5 Pyrolyzer. The pyrolyzer shall conform to the requirements shown in figure 3. The platinum pyrolyzer is used between the outlet of the sample cup and the inlet of the "break-point" indicator bubbler. The pyrolyzer is heated by applying 10 volts, A.C., across the terminals during the test.
- 4.5.2.1.6 <u>Bubbler</u>. The bubbler shall conform to the requirements shown in figure 4.

- 4.5.2.1.7 Schwartz-type drying tube with stop-cocks. The tube shall be filled with activated charcoal as specified in 4.5.2.1.8, loosely packed, as shown in figure 5. Glass wool, loosely packed, shall be placed on top of the activated carbon. The filled tubes shall be stored in a desiccator when not in use.
 - 4.5.2.1.8 Charcoal, cocoanut, activated, 6 to 14 mesh.
- 4.5.2.1.9 Indicator solution. Dissolve 2.5 grams of potasium iodide in 1000-mL of deionized water. Mix 90-mL of this solution with 10-mL of a 1-percent, stable, starch solution. The starch/iodide solution is used in the indicator bubbler. Prepare a fresh starch/iodide solution daily.
 - 4.5.2.1.10 Desiccator.
 - 4.5.2.1.11 Analytical balance.
 - 4.5.2.1.12 "C" type clamp.
 - 4.5.2.1.13 Ice water bath.
 - 4.5.2.2 Determination of carbon tetrachloride concentration.
- 4.5.2.2.1 Tare weight of drying tube. The Schwartz-type drying tube, filled with charcoal and prepared as shown in figure 5, shall be equilibrated to constant weight using the apparatus with a flow of 1 ± 0.03 liter/minute of nitrogen (see figure 1), no carbon tetrachloride. The Schwartz-type drying tube replaces the sample cup for this determination.
- 4.5.2.2.2 <u>Determination of carbon tetrachloride concentration</u>. Sample the carbon tetrachloride vapor from the generator manifold at a rate of 1 liter/minute through the tared Schwartz-type drying tubes (with stop-cocks) for a 15-minute period. Close stop-cocks, cut off the vacuum and disconnect the Schwartz-type drying tube. Allow the tube to come to thermal equilibrium for 10 minutes at ambient temperature. Open and close one stop-cock slowly to equilibrate pressure. Weigh the tube to the nearest milligram.
- 4.5.2.2.3 <u>Calculation</u>. The carbon tetrachloride concentration (mg/liter), is determined by dividing the weight pickup (in mg) by the sampling time (minutes), and flow rate (liters/minute). Determine the carbon tetrachloride concentration during each test run.
- 4.5.2.3 <u>Test specimen</u>. The test specimen shall be a 13.6 ± 0.2 cm diameter piece of the finished fabric. For each 3-yard sample unit cut three specimens equally spaced along left side, three specimens equally spaced along right side, and three specimens equally spaced along the center of the sample unit. Each specimen shall be tested.

- 4.5.2.4 Procedure. Assemble the complete apparatus as shown in figure 1. or each test, mount one layer of the material in the test cup, foam side up. The up-side of the cup is the inlet side in respect to carbon tetrachloride flow. After placing the samples in the cup, clamp the cup halves together with a "C" type clamp. The clamp shall remain on the cup during the entire test. Place 10-mL of the indicator solution in each of the indicator bubblers and immerse the indicator bubblers in an ice water bath and keep immersed during the test. A white background shall be used behind the bubbler to facilitate color detection. Start the flow of carbon tetrachloride through the test sample and record the time for the first tinge of blue to appear in the indicator bubblers. This establishes the original recorded time as the true "break" time. This bubbler is replaced with a fresh bubbler which is run until the latest new bubbler "breaks" within a 2-minute period. If the second bubbler does not show the blue tinge, the test is continued until the second bubbler does show the blue tinge, and this additional time is added to the original break time to establish a new true "break" time. This bubbler is replaced with a fresh bubbler which is run until the latest bubbler "breaks" within a 2-minute period. The additional bubblers are required to confirm that a true "break" has been obtained. The sample cup shall be purged with air after running each sample to assure removal of any residual carbon tetrachloride.
- 4.5.2.5 <u>Calculation</u>. The carbon tetrachloride absorption shall be calculated as follows:

$$mg/cm^2 = \frac{T \times C}{A} \times F$$

Where: T = true break time (minutes)

C = mg carbon tetrachloride/liter

A = area of test specimen (cm²)

F = flow rate (1 liter/minute)

- 5. PACKAGING
- 5.1 Put-up and preservation. Put-up and preservation shall be level A.
- 5.1.1 Level A. The cloth, shall be put-up and preserved in accordance with the applicable requirements of PPP-P-1136, except that each roll of cloth of like description shall be enclosed within two close-fitting clear polyethylene film bags or tubes. The bags or tubes shall be fabricated from polyethylene film having a thickness of 0.003 inch (± 20 percent tolerance). The polyethylene bag shall be formed with heat sealed seams that are straight, continuous, and parallel to each other and the formed edges of the bag. The open end(s) of the bag or tube shall be heat sealed or secured with a mechanical tie (paper or vinyl plastic covered soft steel wire, aluminum band, etc.). Prior to or during the closure operation, excess air within the bag or tubing shall be removed. The first bag or tube around the roll of cloth shall be sealed or secured as specified before insertion within the second bag or tube.

- 5.2 Packing Packing shall be level A, B, or Commercial as specified (see 6.2).
- 5.2.1 Levels A, B, and Commercial. The cloth shall be packed in accordance with the applicable requirements of PPP-P-1136.
- 5.3 Marking. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1136.

6. NOTES

- 6.1 Intended use. The type I and III cloths are intended for use in chemical protective overgarments. Type II cloth is intended for use in chemical and fire protective overgarments.
 - 6.2 Ordering data. Acquisition documents should specify the following:
 - a. Title, number and date of this document.
 - Type required (see 1.2).
 - c. When a first article is required (see 3.1., 4.3, and 6.3).
 - d. Selection of applicable level of packing (see 5.2).
- 6.3 First article. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample consisting of a 3-yard sample of the base cloth, a 3-yard sample of the laminated cloth which has not been impregnated, and a 3-yard sample of the finished laminated cloth. The contracting officer should include specific instructions in all acquisition instruments regarding arrangements for inspection and approval of the first article.
- 6.4 <u>Material impregnation information</u>. Use of the mixtures, and padding described in 6.4.1 through 6.4.2 has been found to produce impregnated cloth that meets the requirements of this document.
- 6.4.1 <u>Carbon slurry</u>. The following suggested formulation has been found to produce a satisfactory carbon slurry for types I, II, and III material when mixed with other ingredients as required (see 6.4.1.1 thru 6.4.1.3).

Carbon slurry (40% solids) 1/	Percent
Carbon (activated) Grancar 1800	35.0
Gransperse M-60 (18% solids)	5.0
Water	29.0
Grantex 288 (28% solids) 5% solution	25.0
Grantex CP (38% solids)	6.0
	100.0

1/ Grant Chemical Company, 125 Main Avenue, Elmwood Park, New Jersey 07407.

The carbon should be dispersed in water with the Gransperse M-60 and colloid milled or subjected to similar high shear mixing to obtain a good dispersion of the particles. A 5-percent solution of Grantex 288 should be added to the latex Grantex CP. The thickened latex and dispersed carbon should then be combined.

Percent

100.0

		Tercenc
6.4.1.1	Impregnating mixture for type I cloth:	
	Carbon slurry (see 6.4.1)	100.0
6.4.1.2	Impregnating mixture for type II cloth:	
		Percent
Ca	arbon slurry (See 6.4.1)	84.0
Phos Chek ^R P-30		4.0
Wa	iter	12.0

Suspend the Phos Chek R P-30 in water and add the suspension to the prepared carbon slurry. Mix thoroughly.

6.4.1.3 Impregnating mixture for typd III cloth:

	Percent
Carbon slurry (see 6.4.1)	70.0
Formulation B 1/	11.0
Water	19.0 <u>2</u> /

- 1/ See 3.2.3.3 for preparation of formulation B.
- 2/ The amount of water may be decreased as needed to obtain the laminated cloth weight.
 - 6.4.1.4 Comparable suggested products.

Activated carbon with an average particle size of 15 microns, sources:

- a. Calgon Corporation, Pittsburg, PA 15230
- b. Carib International, 125 5th Avenue, Paterson, NJ 07508
- c. Barnebey Cheney, Cassady at 8th Avenue, Columbus, Ohio 43219

Dispersing agent SMA-1440 Arco Chemical Co., 1500 Market Street, Philadelphia, PA 19101.

Thickening agent CMC-7M Hercules, Inc., Wilmington, DE 19899

Latex binder Hycar 2671 B.F. Goodrich Chemical Co., 6100 Oak Tree Blvd., Cleveland, Ohio 44131.

6.4.1.5 Sources of prepared slurry. Suggested but not mandatory sources for carbon dispersion are:

Grant Chemical Corp. 125 Main St. Elmwood Park, NJ 07407

Trimont Chemicals Inc. (Protex-a-Cote, Inc.) 27 Haynes Avenue Newark, NJ 07114 Metro Chemical Co. 325 Valley Avenue Providence, RI

Technical Industries Inc. P.O. Box 65 Peace Dale, RI 02883

6.4.1.6 Source of supply for mandatory ingredient.

- 1. Polyox WSRN-80^R (For type III)
 Union Carbide Corp.
 Specialty Chemical and Plastic Division
 Old Ridgebuty Road
 Danbury, CT 00817
- Phos Chek^R P-30 (For type II and type III)
 Monsanto Chemical Co.
 800 N. Lindberg Blvd.
 St. Louis, MO 63166
- 6.4.2 Impregnation padding and drying (types I, II, and III). Padding of the mixture should be accomplished by one pass through squeeze rolls followed by drying at 380°F to attain a final dry add-on necessary to meet the requirements of this document. If a three phase drying oven is used, the settings should be 350°F, 370°F, and 390°F.
- 6.5 <u>Compressometers</u>. Compressometers that have been found to be satisfactory may be purchased from any one of the following (see 4.5.1.2):

Instron Engineering Corporation 2500 Washington Street Canton, MA 02021

W.C. Dillon and Company, Inc. 14604 AE Keswick Street Van Nuys, CA 91405

Baldwin-Lima-Hamilton Corporation Industrial Equipment Division Philadelphia, PA 19142

Tinius-Olsen Testing Machines Willow Grove, PA 19090

- 6.6 Warning. Untreated and processed goods should be protected from exposure to chemical vapors, such as solvents, to prevent contamination of the activated carbon.
- 6.7 Toxicity. Due to the toxicity of carbon tetrachloride, the effluent must be vented into a hood. The exit gases of the vacuum pump and manifold must be vented (see 4.5.2.1.1).
- 6.8 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:

Preparing activity:

Army - GL

Army - GL

Review activities:

Project No. 8305-A044

Army - MD DLA - CT

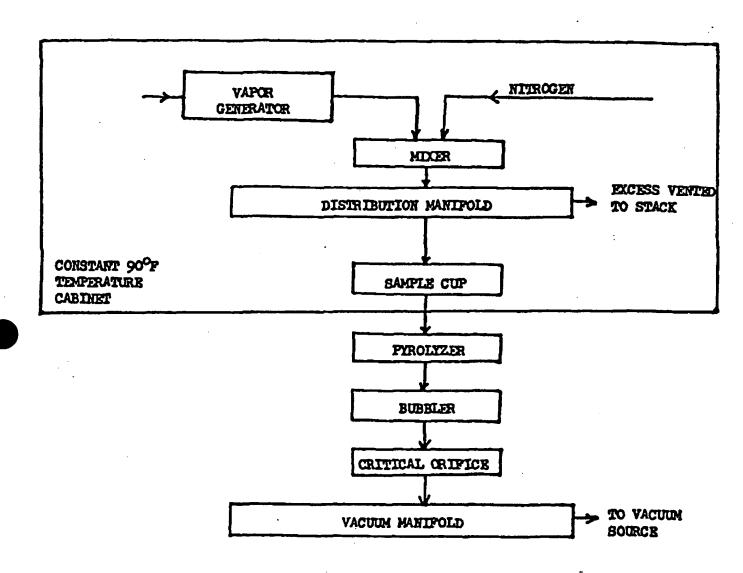
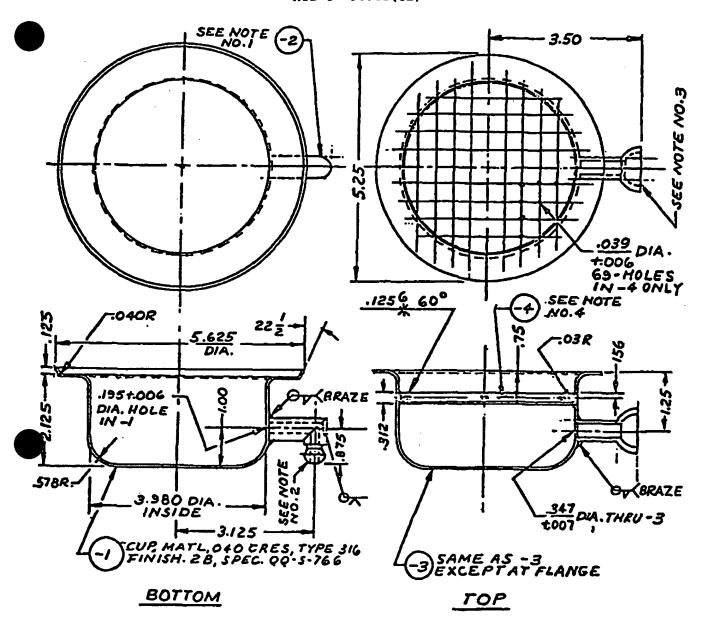


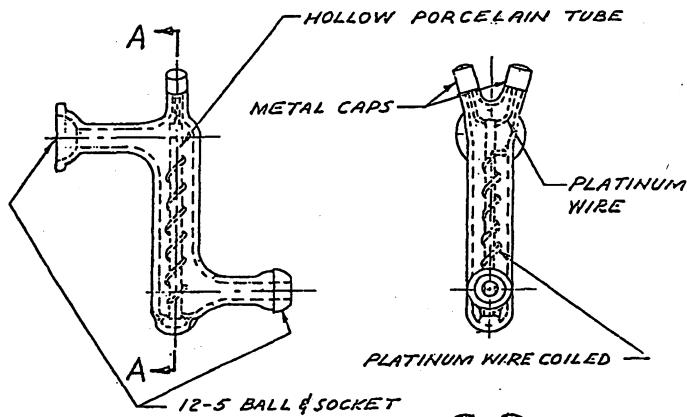
FIGURE 1
FLOW DIAGRAM OF VAPOR PENETRATION APPARATUS



NOTE:

- 1-540-010 O.D. X.190 +.006 I.D. CRES TYPE 316, SPEC. QQ-S-763.
- 2. GROUND JOINT, S, METAL BALL SIZE 12/5, TYPE 31G, CRES. KONTES, TECH GLASS CO., VINELAND, N.J.
- 3. GROUND JOINT S, METAL SOCKET SIZE 18/9 TYPE 316 CRES.
- KONTES TECH GLASS CO., VINELAND, N.J. 4. MAT'L., DZI THICK, CRES, TYPE BIG, FINISH & B, SPEC QQ-S-766
- 5. REMOVE ALL BURRS & BREAK SHARP EDGES.

FIGURE 2. FABRIC SAMPLE CUP



Materials:

- (1) 18 gauge platinum wire used in leads.
- (2) 30 gauge platimum wire used for heating element. Wire is 36 inches long and is wound around a 0.040 diameter wire to produce a coiled element. The 0:040 diameter wire is removed from the coiled wire. One inch of wire is left uncoiled on each end of the heating element to facilitate fusion to the leads.
- (3) The coiled heating element is wrapped around a hollow alundum tube 1/8 inch 0.D. and 1/5 inch I.D.



Scale 1/1

SECTION A-A

FIGURE 3 PYROLYZER

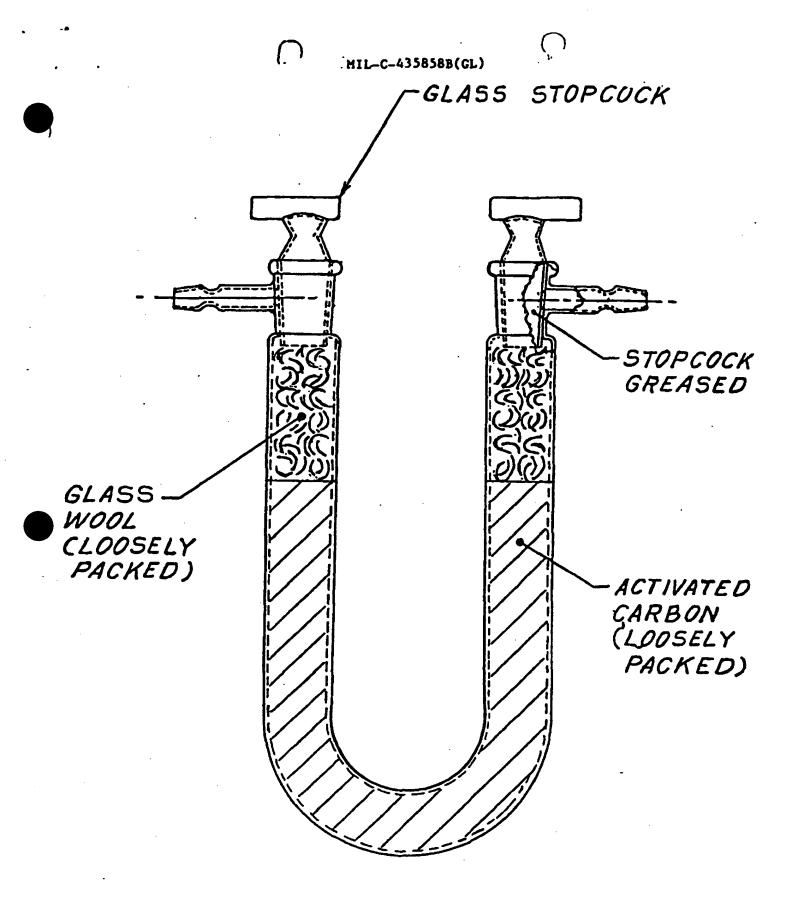


FIGURE 5. SCHWARTZ TYPE DRYING TUBES

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NOTE: This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

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		VENDOR
		Lett
b. ADDRESS (Street, City, Sub., EIF	Code)	MANUFACTURER
		OTHER (Specify):
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b. Recommended Wording:		
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MIL-C-44034C 28 March 1986 SUPERSEDING MIL-C-44034B 28 August 1984

MILITARY SPECIFICATION

CLOTH, TWILL, CAMOUFLAGE PATTERN, COTTON AND NYLON FOR DESERT UNIFORM

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

- 1.1 Scope. This document covers blended cotton and nylon twill cloth which is dyed and overprinted with the prescribed camouflage print.
- * 1.2 Classification. The cloth shall be of the following classes as specified (see 6.2):
 - Class 1 Camouflage pattern for daytime desert uniform
 - Class 1A Camouflage pattern for daytime desert uniform, quarpel treated
 - Class 2 Grid pattern print for desert night parka

2. APPLICABLE DOCUMENTS

2.1 Government documents. Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8305

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

SPECIFICATIONS

FEDERAL

P-S-683 - Sour, Laundry (Fluoridated)

PPP-P-1134 - Packaging of Cotton and Cotton-Synthetic Fiber Blend

Fabrics (Excluding Duck Fabrics)

MILITARY

MIL-D-43362 - Detergent, Laundry (Anionic: A Standard for Testing)
MIL-T-43548 - Thread, Polyester, Cotton-Covered and Rayon Covered

STANDARDS

FEDERAL

FED-STD-4 - Glossary of Fabric Imperfections FED-STD-191 - Textile Test Methods

DRAWINGS

U.S. ARMY MOBILITY EQUIPMENT RESEARCH AND DEVELOPMENT CENTER

Camouflage Pattern for Hot Dry Terrains for Application to Combat Uniforms - 48 inches (classes 1 and 1A)

U.S. ARMY NATICK RESEARCH, DEVELOPMENT, AND ENGINEERING CENTER

2-1-1540 - Pattern for Nighttime Desert Grid - 45 inches (class 2) 2-1-1540A - Pattern for Nighttime Desert Grid - 60 inches (class 2)

(Copies of documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

OTHER GOVERNMENT DOCUMENTS

Rules and Regulations Under the Textile Fiber Products Identification Act

(Copies may be obtained without charge from the Federal Trade Commission, Washington, DC 20580.)

2.2 Other publications. Unless otherwise specified, the following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of this document to the extent specified herein.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

Chromatic Transference Scale

(Application for copies should be addressed to the American Association of Textile Chemists and Colorists, P.O. Box 12215, Research Triangle Park, NC 27709-2215.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D-1424 - Tear Resistance of Woven Fabrics by Falling-Pendulum (Elmendorf) Apparatus

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Technical society and technical association documents are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

- * 3.1 Standard sample. The dyed and printed or dyed, printed, and treated cloth shall match the standard sample for shade and appearance and shall unless otherwise indicated (see 3.4.5), be equal to or better than the standard sample with respect to all characteristics for which the standard sample is referenced (see 6.3).
- 3.2 <u>First article</u>. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3, 6.2, and 6.4).
 - 3.3 Material (see 6.10).
 - 3.3.1 Cotton. The cotton shall be carded.
- 3.3.2 Nylon. The nylon shall be first quality, high tenacity, semi-dull staple having a nominal cut length of 1-1/2 inches and a round cross section with a nominal denier of 2.25 to 2.5. The use of any form of nylon waste is prohibited, such as undrawn fiber, mixtures of deniers, lusters or cross sections, and waste from any stage of fiber production: whether drawn, undrawn, or mixed or garnetted fiber. The contractor shall submit the fiber producer's certification that each lot of nylon staple used conforms to the requirements specified herein.

3.3.3 Yarns. The warp and filling yarn shall be singles made from a blend of 50 + 5 percent nylon and the remaining percentage cotton, based on the dry weight of the desized cloth. Testing shall be performed as specified in 4.4.3.

3.4 Color.

- * 3.4.1 Classes 1 and 1A. The color of the cloth shall be a six color pattern as shown by the drawing "Camouflage Pattern for Hot Dry Terrains for Application to Combat Uniforms" and shall be obtained by roller or automatic screen printing using five or six rollers or screens as appropriate, for the Light Tan 379, Tan 380, Light Brown 381, Dark Brown 382, Black 383 and Khaki 384 areas of the pattern. The use of five rollers or screens is appropriate when the ground shade matches Light Tan 379. The dyeing of the ground shade (Light Tan 379) and the printing of the cloth shall be accomplished with organic colorants (see 6.6.1), to provide a match to each of the six shades of the patterns and to provide the spectral reflectance levels specified in table I. Each dyed and printed color area shall match the specific color on the standard sample (see 6.3). Resin bonded pigment printing will not be permitted.
- 3.4.2 Class 2. The cloth shall have a grid with rubble pattern as shown by Drawing $2^{-1-1540}$ (for 45 inch wide cloth) or $2^{-1-1540}$ A (for 60 inch wide cloth) or by the standard sample (see 6.2 and 6.3). The grid with rubble pattern shall be obtained by screen or roller printing with a resin bonded Dark Green 425 colorant over Light Green 426 ground shade (see 6.6.2). The grid pattern bow shall not exceed 3 percent when tested as specified in 4.4.3.
- 3.4.3 Labile sulfur. The use of dyes and compounds containing sulfur capable of oxidation to sulfuric acid shall be chosen and applied such that the dyed cloth shall contain no more labile sulfur than shown by the standard sample when tested as specified in 4.4.3. When no standard sample is available, the dyed cloth shall show no more than a slight trace of labile sulfur as defined in the test method when tested as specified in 4.4.3.
- * 3.4.4 <u>Matching</u>. Each color of the pattern of the finished cloth shall match the standard sample when viewed under filtered tungsten lamps which approximate artificial daylight having a correlated color temperature of 7000 ± 500 K, with illumination of 100 ± 20 foot candles, and shall be a good match to the standard sample under incandescent lamplight at 2300 ± 100 K.
- 3.4.5 <u>Colorfastness</u>. The printed finished cloth shall show fastness to light, laundering (after three cycles), and perspiration equal to or better than the standard sample or equal to or better than the rating of "good" for each of the pattern areas when tested as specified in 4.4.3. The cloth shall show fastness to crocking equal to better than the standard sample or shall have an AATCC Chromatic Transference Scale rating not lower than 3.5 for all the pattern areas, except Black 383 which shall have an AATCC Chromatic Transference Scale rating not lower than 1.5, when tested as specified in 4.4.3.

- * 3.5 Pattern execution, classes 1 and 1A. The pattern of the finished cloth shall match the standard sample with respect to design, colors, and registration of the respective areas. The warpwise pattern repeat of the dyed, printed and finished cloth shall be 16.75 + 1.25 1.75 inches (see 6.11). Each pattern area shall show solid coverage; skitteriness exceeding that shown by the standard sample in any of the printed areas will not be acceptable.
- * 3.5.1 Spectral reflectance, classes 1 and 1A. The spectral reflectance of each color area, except Black 383, for the Daytime Desert Camouflage printed cloth shall conform to the requirements specified in table I, when tested as specified in 4.4.3.

TABLE I. Spectral reflectance requirements

	Reflectance values (percent)					
Wavelengths	Light Tan Tan 380 and 379 1/ Khaki 384			Light Brown 3 and Dark Brown 38		
nanometers	(min)	(min)	(max)	(min)	(max)	
700	38	25	41	19	28	
720	38	25	41	20	29	
740	39	25	41	20	29	
760	40	26	42	21 .	30	
780	41	27	43	21	30	
800	43	28	44	22	31	
820	45	30	46	23	32	
840	48	33	48	24	33	
860	50	36	· 50	25	34	

- 1/ Light Tan 379 has no specified maximum values.
- * 3.5.2 Spectral reflectance, class 2. The dyed and finished cloth shall have a composite measurement for spectral reflectance of 25 ± 5 percent when measured at 1 micrometer when tested as specified in 4.4.3.
- * 3.6 Physical requirements. The finished cloth shall conform to the requirements in table II when tested as specified in 4.4.3.

TABLE II. Physical requirements

	Wt. per	incl	ns per h imum	stre	king ngth imum	Tear stre mini	ngth	Air permea- bility (cu. ft/min/sq.
Class	minimum Ounces	Warp	Filling	Warp Pounds	Filling Pounds	Warp Pounds		ft.) max. ave. (see 6.17)
1&2	6.8	86	54	200	125	11	8	25.0
1 A	7.0	86	54	190	115	10	7	10.0

- 3.6.1 Weave. The weave shall be 2/1 left hand twill.
- * 3.6.2 Width. The width of the cloth shall be as specified (see 6.2), and shall be the minimum acceptable width inclusive of selvage when fly shuttle looms or shuttleless with tuck-in selvage looms are used. For all other shuttleless looms the width measurement shall be made between the last warp yarn on each side excluding the protruding fringe(s).
- * 3.7 <u>Finish</u>. The cloth shall be dyed and overprinted with the warp effect side as the face. The cloth shall be closely singed, desized, mercerized, dyed, and printed. The class 1A cloth shall also be quarpel treated (see 3.7.2).
- 3.7.1 Non-fibrous material. The starch and protein content including chloroform-soluble and water-soluble material of the scoured and printed cloth shall not exceed 2.0 percent when tested as specified in 4.4.3.

.

* 3.7.2 Water repellency (class 1A). The class 1 A cloth shall be given an approved Quarpel type (see 6.16) water repellent treatment and shall conform to the water repellency requirements of table III and 3.7.2.1 when tested as specified in 4.4.3. The use of materials other than approved water repellents are prohibited. The cured fabric shall be afterwashed to remove all unreacted reagents.

TABLE III. Water repellency requirements (class 1A)

Hydrostatic height (centimeters) minimum	Dynamic absorption (percent) maximum		
18.0	20.0		

- * 3.7.2.1 Spray rating. The results of the three individual determinations on the sample unit for spray rating shall be equal to or better than ratings 100, 100, 90 when tested as specified in 4.4.3.
- * 3.7.2.2 <u>Liquid repellency</u>. The treated finished class IA cloth shall show no wetting by n-dodecane after 30 seconds and no wetting by tri-ethyl phosphate, di-methyl phosphonate and bis (2 ethyl hexyl) hydrogen phosphite after 8 hours when tested as specified in 4.4.3.
- 3.8 <u>Dimensional stability</u>. The shrinkage or elongation both in the warp and in the filling of the finished cloth shall not be greater than 3.5 percent for the individual sample unit and not greater than 3.0 percent for the lot average when tested as specified in 4.4.3. The preshrinkage process used shall not be identified by name or trademark either on the cloth, ticket or package.
- 3.9 pH. The pH value of the water extract of the finished cloth shall be no lower than 5.0 nor higher than 8.5 when tested as specified in 4.4.3.

- 3.10 Seam efficiency. The finished cloth shall have a seam efficiency of no less than 80 percent when tested as specified in 4.4.3.
- 3.11 <u>Length and put-up</u>. Unless otherwise specified (see 6.2), the cloth shall be furnished in continuous lengths, each not less than 40 yards. Each length shall be put up on a roll as specified in 5.1.
- 3.12 <u>Fiber identification</u>. Each roll shall be labeled or ticketed for fiber content in accordance with the Rules and Regulations Under the Textile Fiber. Products Identification Act.
- 3.13 Workmanship. The finished cloth shall conform to the quality established by this document. The demerit points per 100 square yards shall not exceed the established maximum point value.

4. QUALITY ASSURANCE PROVISIONS

- 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the document where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.
- 4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this document shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the document shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicted or actual, nor does it commit the Government to acceptance of defective material.
- 4.1.2 <u>Certificate of compliance</u>. Where certificates of compliance are submitted, the Government reserves the right to check test such items to determine the validity of the certification.
- 4.2 <u>Classification of inspection</u>. The inspection requirements specified herein are classified as follows:
 - a. First article inspection (see 4.3).
 - b. Quality conformance inspection (see 4.4).

- 4.3 First article inspection. When a first article is required (see 6.2), it shall be examined for appearance, color, and finish defects and shall be tested for the characteristics specified in table III. The presence of any defect or failure of any test shall be cause for rejection of the first article.
 - 4.4 Quality conformance inspection.
- 4.4.1 Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this document or applicable purchase document.
- * 4.4.2 End item examination. The maximum lot size shall be 150,000 linear yards.
- 4.4.2.1 Yard-by-yard examination. Each roll in the sample shall be examined on the face side only (printed side). When the total yardage in the roll does not exceed 100 yards, the entire yardage in the roll shall be examined. When the total yardage in the roll exceeds 100 yards, only 100 yards shall be examined. All defects, as defined in Section I of FED-STD-4, which are clearly noticeable at normal inspection distance (3 feet) shall be scored and assigned demerit points as listed in 4.4.2.1.1, except that only those slubs and knots which exceed the maximum limits shown on Sears Fabric Defect Scales (see 6.5), E or 3 as applicable for slubs and D for knots, shall be scored. No linear yard (increments of 1 yard on the measuring device of the inspection machine) from any roll within the sample shall be penalized more than four points. The sample size shall be 20 rolls selected from 20 containers. The lot shall be unacceptable if the points per 100 square yards of the total yardage examined exceeds 30 points. The lot shall be unacceptable if the points per 100 square yards of two or more individual rolls exceeds 45 points. If one roll in the sample size of 20 exceeds 45 points per 100 square yards, a second sample of 20 rolls shall be examined for individual roll quality only. The lot shall be unacceptable if one or more rolls in the second sample exceeds 45.0 points per 100 square yards. Point computation for lot quality and individual roll quality shall be as follows:

Total points scored in sample x 3600 Points per 100 Contracted width of cloth (inches) x Total yards inspected square yards

4.4.2.1.1 Demerit points. Demerit points shall be assigned as follows:

For defects up to and including 3 inches in any dimension - one point

For defects exceeding 3 inches but not exceeding 6 inches

in any dimension - two points

For defects exceeding 6 inches but not exceeding 9 inches in any dimension

three points

For defects exceeding 9 inches in any dimension

- four points

The following defects, when present, shall be scored four points for each yard in which they occur:

- * Objectionable odor Baggy, ridgy, or wavy cloth Width less than specified Edge ravels when pulled outward Slack or tight selvages 1/ Overall uncleanness Pattern design not equal to standard sample Incorrect color in any part of the pattern Pattern repeat not equal to the standard sample Warpwise pattern repeat less than 15.0 inches or more than 18.0 inches (classes 1 and 1A) Skitteriness (mottled, uneven color) of pattern exceeds that shown by standard sample Excessive feathering or spew (fuzziness at color boundaries) of pattern as compared to the standard sample Excessive grinning (off register, gap where ground shade shows through) of pattern as compared to the standard sample Excessive haloing or trapping (overlapping of colors) of pattern as compared to the standard sample
- 1/ To determine the presence of unacceptable selvage conditions, the following procedure shall be observed: During the visual examination, the perch shall be stopped a minimum of three times for each roll in the sample, the tension removed and the finished cloth examined for the selvage conditions. Suspect rolls should be removed from the perch and unrolled on the floor or a table and further examined for the condition. A waviness in the selvage or significant ripples diagonally across the width of the fabric is an indication of slack or tight selvages.
- 4.4.2.2 Length examination. During the yard-by-yard examination, each roll in the sample shall be examined for length. Any length found to be less than the minimum specified or more than 2 yards less than the length marked on the ticket shall be considered a defect with respect to length. The lot shall be unacceptable if two or more rolls in the sample are defective in respect to length or if the total of the actual lengths of rolls in the sample is less than the total of the lengths marked on the ticket.
- 4.4.2.3 Shade and appearance examination. During the yard-by-yard examination, each roll in the sample shall be examined for shade and appearance. If any one component color in any roll of the sample is off shade or does not have the same appearance as the standard sample it shall be cause for rejection of the entire lot represented by the sample.

- 4.4.2.4 Roll identification examination. During the yard-by-yard examination, each roll in the sample shall be examined for proper identification. The lot shall be unacceptable if two or more rolls in the sample are not labeled or ticketed in accordance with the Textile Fiber Products Identification Act.
- * 4.4.3 End item testing. The cloth shall be tested for the characteristics listed in table IV. The methods of testing specified in FED-STD-191 whenever applicable and as listed in table IV shall be followed. All test reports shall contain the individual values utilized in expressing the final results. The sample unit shall be 3 continuous yards full width of the finished cloth (for classes 1 and 2) or 4 continuous yards full width of the finished cloth (for class 1A), for all physical and chemical tests except dimensional stability (see 4.4.3.1). The lot shall be unacceptable if one or more sample units or the lot average for dimensional stability fail to meet any requirement specified. The maximum lot size shall be 150,000 linear yards. The sample size except for dimensional stability shall be in accordance with the following:

TABLE IV. End item tests

	Requirement	Test
Characteristic	paragraph	method
Material		
Cotton fiber identification	3.3.1	1200 <u>1</u> /
Nylon:		
Identification	3.3.2	1530 <u>1</u> /
Luster	3.3.2	1/
Denier	3.3.2	$\overline{1}$ /
Absence of nylon waste	3.3.2	$\frac{1}{1}$ / $\frac{1}{1}$ /
Fiber content:		
Cotton content	3.3.3	2530 1/ 2/
Nylon content	3.3.3	$2530 \ \overline{1}/$
Grid pattern bow (class 2)	3.4.2	5060
Presence of labile sulfur	3.4.3	2020 <u>1</u> /
Colorfastness to:		
Light	3.4.5	5660
Laundering (after 3 cycles)	3.4.5	5610
Perspiration	3.4.5	5680
Crocking	3.4.5	5651

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TABLE IV. End item tests (cont'd)

•	Ē	•
Characteristic	Requirement paragraph	Test method
Spectral reflectance: Classes 1 and 1A	3.5.1	4.5.1
Classes I and IA	3.5.2	4.5.2
Weight	3.6	5041
Yarns per inch	3.6	5050
	!	
Breaking strength	3.6	5100
Tearing strength	3.6	ASTM D-1424
	<u>.</u> :	
Air permeability	3.6	5450
Weave	3.6.1	Visual <u>1</u> /
	a a	1/
Singed	3.7	<u>1</u> /
Desized	3.7	<u>1</u> /
Mercerized	3.7	· <u>1</u> /
Non-fibrous material	3.7.1	2611
Water repellent (class 1A)	3.7.2	<u>3</u> /
Hydrostatic pressure (class 1A)	3.7.2	5514
Dynamic absorption (class 1A)	3.7.2	5500
Spray rating (class 1A)	3.7.2.1	5526
Liquid repellency (class 1A)	3.7.2.2	4.5.3
Dimensional stability	3.8	4.4.3.1
рН	3.9	2811
Seam efficiency	3.10	5110 <u>4</u> /

 $[\]underline{1}/$ Unless otherwise specified, a certificate of compliance shall be submitted and will be acceptable for the stated requirement.

2/ The cotton content shall be calculated as follows:

Cotton content, percent = $\frac{R}{S} \cdot x \cdot 100$

- R = Weight of residual fibers
- S = Weight of dry desized specimen
- 3/ The contractor shall report the water repellents used and certify that no other material has been added.
- 4/ The needle shall measure 0.040 ± 0.001 inch across the blade at the eye.
 The thread shall be polyester/cotton-covered or rayon covered in accordance with MIL-T-43548, ticket no. 50, 2 or 3 ply for the needle and ticket no. 70 2 or 3 ply for the looper.
- * 4.4.3.1 <u>Dimensional stability testing</u>. The cloth shall be tested for dimensional stability in accordance with 4.5.4 through 4.5.4.6.3. The sample unit shall be 2 continuous yards full width of the finished cloth. The lot size shall not exceed 150,000 yards. The sample size shall be in accordance with the following:

Lot size (yards) 10,000 or less 10,001 up to and including 35,000 35,001 up to and including 150,000 Sample size (number of sample units) 8 31,001 up to and including 150,000 13

- 4.4.4 <u>Packaging inspection</u>. The inspection shall be in accordance with the quality assurance provisions of PPP-P-1134.
 - 4.5 Methods of inspection.
- * 4.5.1 Spectral reflectance test (classes 1 and 1A). Reflectance shall be obtained from 700 to 860 nm relative to barium sulfate, the preferred white reference standard. Other reference white materials may be used (Halon, magnesium oxide, or vitrolite tile), provided they are calibrated to absolute white (see 6.7). The spectral band width at 860 nm shall be less than 25 nm. Reflectance measurements may be made by either the monochromatic or polychromatic mode operation. When the polychromatic mode operation is used, the spectrophotometer (see 6.9) shall operate with the specimen diffusely illuminated with the full emission of a continuous source that simulates in the visible spectrum either CIE Source A or CIE Source D65. Specimens shall be measured as a single layer backed with two layers of the same shade cut from the standard. Readings shall be taken on a minimum of two different areas, and the data averaged. The specimen shall be viewed at any angle no greater than 10

degrees from normal. Photometric accuracy of the spectro-photometer shall be within 1 percent and the wavelength accuracy shall be within 2 nm. When the measured reflectance values for any color at four or more of the listed wavelengths do not meet the limits specified in table I, it shall be considered a test failure.

- * 4.5.2 Spectral reflectance test (class 2). The spectral reflectance shall be determined by recording the reflectance relative to barium sulfate at 1 micrometer using a spectrophotometer as described in 4.5.1 or using a photometer consisting of the following elements: a tungsten filament lamp, infrared filter having a low wave length cut off at 0.9 micrometer, a photodetector with an S-1 surface of appropriate sensitivity, a galvanometer of the spotlight type with a 0 to 100 scale on a microammeter of comparable sensitivity (see 6.8). The photometer shall be calibrated with vitreous enamel gray standards available from photometer manufacturers. Specimens shall be measured as a single layer backed with an additional two layers of the same fabric. The face sides of all three layers shall be toward the instrument port. The grid pattern of each layer shall be arranged so as to be superimposed on the pattern of the layer beneath. A minimum of five readings shall be made on each sample grid area only excluding rubble and the average of the readings shall be reported to the nearest unit. The standard aperature size used in the color measurement device shall be 1.0 to 1.25 inches in diameter.
- * 4.5.3 Liquid repellency test. Place a small specimen of the treated finished camouflage cloth (comprised of all six colors in the pattern) on a smooth horizontal surface, face-up. Using a pipette or eye dropper, gently deposit a drop of each liquid specified in 3.7.2.2 on the surface of each shade of the camouflage pattern. After 30 seconds, examine each color of the specimen under light at an angle. Absence of light reflectance at the cloth-drop interface for the n-dodecane drop shall be taken as evidence of wetting. The test shall be continued for 8 hours for the drops of tri-ethyl phosphate, di-methyl phosphonate, and bis (2 ethyl hexyl) hydrogen phosphite. Absence of light reflectance at the cloth-drop interface for the three liquids after the 8-hour period shall be taken as evidence of wetting. Three specimens taken at various locations across the sample unit shall be tested. Evidence of wetting on any color of one or more specimens shall be considered a test failure.
- * 4.5.4 <u>Dimensional stability testing procedures</u>.
- 4.5.4.1 Test specimen. The test specimen shall be a square of cloth 24 inches by 24 inches.
- 4.5.4.1.1 <u>Number of determinations for dimensional stability</u>. Three specimens from each sample unit shall be tested in each of the warp and filling directions.

4.5.4.2 Apparatus.

4.5.4.2.1 Wash wheel (see 6.12). A cylindrical wash wheel of the reversing type shall be used. The wheel (cage) shall be 20 to 24-1/2 inches inside diameter and 20 to 24 inches inside length. There shall be three fins each approximately 3 inches wide extending the full length of the inside of the wheel. One fin shall be located every 120 degrees around the inside diameter of the wheel. The wash wheel shall rotate at a speed of 30 ± 4 revolutions per minute making 5 to 10 revolutions before reversing. The water inlets shall be large enough to permit filling the wheel to an 8 inch level in less than 2 minutes, and the outlet shall be large enough to permit discharge of this same amount of water in less than 2 minutes. The wash wheel shall be equipped with a pipe for injecting live steam that shall be capable of raising the temperature of water at an 8 inch level from 100° to 140°F in less than 2 minutes.

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- 4.5.4.2.2 Wash wheel equipment. The wash wheel shall be equipped with a thermo-meter or other equivalent equipment for determining the temperature of the water during the washing and rinsing procedures, and with an outside water gage that will indicate the level of the water in the wheel.
- 4.5.4.2.3 Preheating tank or other device. A preheating device to supply water in quantity within $+4^{\circ}F$.
- 4.5.4.2.4 Extractor (see 6.13). A centrifugal extractor of the laundry type with a perforated basket, approximately 11 inches deep by 17 to 20 inches in diameter with an operating speed of approximately 1500-1725 revolutions per minute.
- 4.5.4.2.5 <u>Drier (see 6.12)</u>. A drier of the rotary, tumble type having a cylindrical basket approximately 36 inches in diameter and 24 inches in length and rotating at 35 ± 2 revolutions per minute. The drier shall be capable of maintaining a stack temperature within \pm 5°F of the specified test temperature. The stack temperature shall be measured 20 ± 2 inches from the exhaust opening of the drier.
- 4.5.4.2.6 Stamping device (see 6.15). A device capable of marking off an 18 inch distance with fine indelible ink lines.
- 4.5.4.2.7 Measuring ruler (see 6.15). Plastic type, graduated to give percent change directly in 0.2 percent increments and read to the nearest 0.1 percent. (Based on an original 18 inch marking.)
- 4.5.4.2.8 Balance. Balance or scale capable of weighing the specimen to an accuracy of \pm 0.01 g.
 - 4.5.4.3 Reagents.
- 4.5.4.3.1 Synthetic detergent (see 6.14). Synthetic detergent shall conform to MIL-D-43362.

- 4.5.4.3.2 Sour. Sour shall conform to type I of P-S-683.
- 4.5.4.3.3 Water of not over 50 parts per million hardness.
- 4.5.4.4 Procedure.

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- 4.5.4.4.1 Preparation of cloth. Prior to initial markings for determining dimensional stability and prior to determining the change after laundering, the cloth shall be brought to equilibrium under standard atmospheric conditions as defined in section 4 of FED-STD-191. (A minimum of 4 hours is required.) A flat, open mesh screen rack is recommended for this purpose.
 - 4.5.4.4.2 Preparation of specimen for dimensional stability.
- 4.5.4.4.2.1 Selection of specimens. The three specimens shall be cut from the cloth (sample unit) as follows: One specimen from each side of the cloth to within 3 inches of the selvage and one specimen from the center of the cloth. No two specimens shall contain the same filling yarns. The cloth edges shall be slit by 1 inch diagonal cuts at intervals of about 6 inches on all four sides of the test specimen. The specimens shall be laid without tension on a flat surface, care being taken that the cloth is free from wrinkles or creases. Three distances, each 18 inches apart shall be measured and marked off parallel to each of the warp and filling directions of the specimen. The distance shall be a minimum of 6 inches apart and 2 inches from any edge of the specimen. The distance should be marked with indelible ink by a stamping device. The measured distance shall be parallel to the respective yarns.
- 4.5.4.4.2.2 Standard load. A standard load comprising the specimens under test and clean ballast of comparable size, weight, and type of cloth shall be utilized. A total weight of 20 pounds consisting of specimens and ballast shall be used for the test.
- 4.5.4.4.2.3 <u>Laundering procedure</u>. Water of not over 50 parts per million hardness at the required temperature ± 4°F; shall be introduced into the wash wheel to the designated level. The schedule of table V shall be followed. At the end of each time interval, the machine shall be stopped, drained without removing the load, and refilled to the proper level before starting again. The wheel shall be in motion a total of 22 minutes during the period of testing.

TABLE V. Laundering schedule

Operation	Composition	Water volume gallons	Water level inches 1/	Temperature OF	Time (minutes)
1. Suds	Synthetic detergent (13 g)	14.3	6	100	5

TABLE V. Laundering schedule (cont'd)

Operation	Composition	Water volume gallons	Water level inches 1/	Temperature OF	Time (minutes)
2. Suds	Synthetic detergent (7 g)	9.3	4	140	5
3. Rinse	•	20.5	8.	140	3
4. Rinse		20.5	8	120	3
5. Rinse	Sour (24 g)	20.5	8	100	3
6. Rinse		20.5	8	100	3 22

^{1/} The water levels are based on a machine with an inside diameter of 28-1/2 inches and an inside length of 23-1/2 inches and may have to be adjusted to give the specific volumes.

4.5.4.4.2.4 <u>Drying, procedure</u>. After laundering, the standard load shall be extracted in two equivalent portions, a minimum of 3 minutes each. The specimens shall be separated, opened to full width and dried together with the ballast at $190^{\circ} \pm 5^{\circ}$ F for 60 minutes in a rotating tumble drier.

4.5.4.5 Evaluation.

4.5.4.5.1 Evaluation of cloth for dimensional stability. Immediately after tumble drying, each specimen shall be laid out, without tension or pressing, on a flat surface in the standard atmosphere until moisture equilibrium is reached. (A minimum of 4 hours is required.) Care shall be taken that the specimen is smooth and free from wrinkles or creases. The previously measured distance marked on the specimen shall again be measured in both the warp and filling direction using the measuring ruler specified in 4.5.4.2.7.

4.5.4.5.2 <u>Calculation of results</u>. The dimensional stability of the specimens shall be calculated as follows:

Shrinkage, percent =

Average of percent measurements after laundering (three specimens)

4.5.4.6 Report of test results.

4.5.4.6.1 Dimensional stability.

- 4.5.4.6.2 Shrinkage. The shrinkage of the sample unit in the warp direction and in the filling direction shall be the average of three specimens tested from each direction, respectively, and shall be reported separately to the nearest 0.1 percent.
- 4.5.4.6.3 Elongation. When a test result registers elongation rather than shrinkage, each elongation result shall be prefixed with a minus sign with both the minus sign and the value inclosed in parenthesis.

PACKAGING

- 5.1 Put-up and preservation. Put-up and preservation shall be level A or Commercial as specified (see 6.2).
- 5.1.1 <u>Levels A and Commercial</u>. The cloth shall be put-up and preserved in accordance with the applicable requirements of PPP-P-1134.
- 5.2 <u>Packing</u>. Packing shall be level A, B, or Commercial as specified (see 6.2).
- 5.2.1 Levels A, B and Commercial. The cloth shall be packed in accordance with the applicable requirements of PPP-P-1134.
- 5.3 <u>Marking</u>. In addition to any special marking required by the contract or purchase order, shipments shall be marked in accordance with the applicable requirements of PPP-P-1134.

6. NOTES

- 6.1 <u>Intended use</u>. The class 1 cloth is intended for use in the Daytime Desert Uniform. The class 1A cloth is intended for use in the Daytime Desert Camouflage Printed Uniform requiring Quarpel treatment. Class 2 cloth is intended for use in the Desert Night Parka and Trousers.
 - 6.2 Ordering data. Acquisition documents should specify the following:
 - a. Title, number, and date of this document.
 - b. Class of cloth required (see 1.2).
 - c. When a first article is required (see 3.2, 4.3, and 6.4).
 - d. Pattern drawing if required (see 3.4.2).
 - e. Width of cloth required (see 3.6.2).
 - f. Length required, if other than specified (see 3.11).
 - g. Selection of applicable levels of preservation and packing (see 5.1 and 5.2).

- 6.3 Standard sample. For access to standard sample, address the contracting activity issuing the invitation for bids.
- 6.4 <u>First article</u>. When a first article sample is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in all acquisition instruments regarding arrangements for selection, inspection, and approval of the first article.
- 6.5 <u>Fabric defect scales</u>. Fabric Defect Replica Kits are available from Sears Roebuck and Company, Department 817, (ATTN: BSC 23-29), Sears Tower, Chicago, IL 60684.

6.6 Pattern areas.

6.6.1 Dye information, classes 1 and 1A. The areas of the pattern have been found to be satisfactory when dyed or printed with various combinations of the following dyes for 6 colored areas:

Light Tan 379 (Ground Shade)

Vat	Yellow 33
Vat	Brown 1
Vat	Black 25
Vat	Olive Green 2GI
Vat	Gray 2 GR

Tan 380

Vat	Brown	3
Vat	Brown	33
Vat	Brown	1
Vat	Yellow	33
Vat	Black	25

Light Brown 381

Vat	Brown	3
Vat	Brown	33
Vat	Brown	57
Vat	Brown	1
Vat	Yellov	33

Dark Brown 382

Vat	Brown	3
Vat	Brown	33
Vat	Brown	1
Vat	Brown	57
Vat	Yellow	7 33

Black 383

Sulf	ur	Bla	ick	٠6
Vat	Bla	ck	11	

Khaki 384

Brown 1 Vat Brown 3 Vat Yellow 33 Vat Olive Green 2GI

6.6.2 Dye formulation, class 2. Satisfactory colors with a resin bonded grid have been obtained with the following formulas:

Light Olive Green 426 (ground shade)

Acid Blue 258
Acid Yellow 219
Acid Red 266
Vat Blue 6

Vat Orange 1 Vat Brown 57 Vat Green 3

Grid Overprint 425

Resin Bonded Pigments Chrome Oxide Green Carbon Black

- * 6.7 Source of material. Barium sulfate and Halon of suitable quality for use as a white standard is available from Eastman Kodak Co. Suitable white tiles are available from the National Bureau of Standards or spectrophotometer manufacturers (see 4.5.1).
- 6.8 Photometers. Infrared photometers and appropriate calibration standard that meets the needs of 4.5.2 may be obtained from:

Hunter Labs 11495 Sunset Hills Road Reston, Va 22090

- 6.9 Spectrophotometers. Suitable spectrophotometers that meet the requirements of 4.5.1 are the Diano Hardy, Diano Matchscan, and Hunter D54P-IR spectrophotometers.
- 6.10 Recycled material. It is encouraged that recycled material be used when practical as long as it meets the requirements of the document (see 3.3).
- * 6.11 Heat setting. The contractors are cautioned to insure that the cloth prior to printing has been properly heat set in order that the final dimensions of the pattern will be within the limits set forth in 3.5.
- * 6.12 Wash wheel and drier. The wash wheel and drier as described may be obtained from Ewing Division of Powercom, P. O. Box 454, Troy, NY 12181.
- * 6.13 Extractor. The extractor may be obtained from Ewing Division of Powercom, P.O. Box 454, Troy, NY 12181, American Laundry Machinery Company, 5050 Section Avenue, Cincinnati, OH 45212, Bock Co., 3600 Summit Street, Toledo, OH 43611, Troy Machinery, East Moline, IL 61244, and Pellerin Milnor Corporation, Kenner, LA 70062.

- T-77) may be obtained from GAF Corporation, Dyestuff and Chemical Division, 140 West 51st Street, New York, NY 10020.
- 6.15 Ruler, stamping device and ink. The measuring ruler, stamping device and indelible ink may be obtained from the Sanforized Co., 433 River Street, Troy, NY 12180.
- treatment consists of the co-application of an emulsified fluorocarbon and a fluorocarbon extender. Approval of components and combinations is the responsibility of U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5014 and is based on extensive tests, including those for toxicity which are not set forth in this document. Because of the time necessary to conduct full evaluation (approximately 6 months) only those chemical treatments already approved and so listed in the invitation for bids or request for proposal shall be considered acceptable for the related procurement.
- 6.17 Air permeability. Not all untreated cloth meeting the air permeability requirement for classes 1 and 2 will, after quarpel treatment, be capable of meeting class 1A air permeability requirements.
- 6.18 Changes from previous issue. The margins of this document are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only as the Government assumes no liability whatsoever for any inaccuracies in these notions. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

Army - GL

Navy - NU

Air Force - 11

Preparing activity:

Army - GL

Project No. 8305-0052

Review activities:

Army - MD

Navy - MC

Air Force - 82, 99

DLA - CT

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INCH-POUND

MIL-S-43926J
30 August 1991
SUPERSEDING
MIL-S-43926H
25 March 1988

MILITARY SPECIFICATION

SUIT, CHEMICAL PROTECTIVE

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

- 1.1 Scope. This specification covers a disposable suit for wear as an overgamment to protect against chemical warfare agents for periods of 1 to 22 days. The suit consists of separate coat and trousers and is made with a cotton/mylon shell and a sewn in laminated foam lining impregnated with activated charcoal. This is a special purpose Life Support Clothing and Equipment (LSC&E) item. All Government administrative and surveillance procedures applicable to LSC&E items shall be invoked in accordance with the contract or purchase order (see 6.2).
- 1.2 <u>Classification</u>. The suit shall be of one type in the following classes and sizes (see 6.2).

Class 1 - Woodland Camouflage Class 2 - Deleted (see 6.7)

Class 3 - Desert Camouflage (3 color)

Schedule of sizes

XXX-Small	Medium	Large
XX-Small		X-Large
X-Small		XX-Large
Small		J .

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be used in improving this document should be addressed to: U.S. Army Natick Research, Development, and Engineering Center, Natick, MA 01760-5019 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 8415

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 <u>Specifications, standards and handbooks</u>. The following specifications, standards and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

A-A-208		Ink, Marking, Stencil, Opaque (Porous and Non- Porous Surfaces)
A-A-50198	-	Thread, Gimp, Cotton Buttonhole
A-A-50199	-	Thread, Polyester Core, Cotton- or Polyester- Covered
V-F-106	-	Fasteners, Slide, Interlocking
DDD-L-20	-	Label: For Clothing, Equipage, and Tentage, (General Use)
PPP-B-636	_	Boxes, Shipping, Fiberboard
PPP-F-320	-	Fiberboard: Corrugated and Solid, Sheet Stock (Container Grade) and Cut Shapes

MILITARY

MIL-B-117	-	Bags, Sleeves and Tubing
MIL-B-371	_	Braid, Textile, Tubular
MIL-B-543	_	Buckles, Tonqueless and Web Strap
MIL-D-3464	-	Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification
MIL-T-3530	-	Thread and Twine, Mildew Resistant or Water Repellent Treated
MIL-F-10884		Fasteners, Snap
MIL-C-12189	-	Cloth, Coated: Butyl Coated, Toxicological Agents Protective
MIL-G-16491	_	Grommet, Metallic, General Specification for
MIL-F-21840		Fastener Tapes, Hook and Loop, Synthetic
MIL-L-35078		Loads, Unit: Preparation of Semiperishable
		Subsistence Items; Clothing, Personal Equipment and Equipage; General Specification For
MIL-C-43303	_	Cord, Elastic, Cotton
MIL-T-43566	-	Tape, Textile, Cotton or Polyester, General Purpose, Natural or in Colors
MIL-C-43858	-	Cloth, Laminated, Nylon Tricot Knit, Polyurethane Foam Laminate, Chemical Protective and Flame Resistant

MIL-C-44031 - Cloth, Camouflage Pattern: Woodland, Cotton and

Nylon

MIL-C-44034 - Cloth, Twill, Camouflage Pattern, Cotton and Nylon

For Desert Uniform

MIL-P-44406 - Pouches, Plastic Film

STANDARDS

FEDERAL

FED-STD-101 - Test Procedures for Packaging Materials FED-STD-595 - Colors Used in Government Procurement

FED-STD-751 - Stitches, Seams, and Stitchings

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection

by Attributes

MIL-STD-129 - Marking for Shipment and Storage

MIL-SID-147 - Palletized Unit Loads

MIL-STD-731 - Quality of Wood Members for Containers and Pallets

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 <u>Non-Government publications</u>. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASIM)

F 88 - Test Method for Seal Strength of Flexible Barrier Materials

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.)

(Non-Government standards and other publications are normally available from organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

- 3.1 <u>First article</u>. When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.
- 3.2 <u>Guide samples</u>. Guide samples, when furnished, are solely for guidance and information to the contractor (see 6.4). Variations from this specification may appear in the sample, in which case this specification shall govern.
- 3.3 <u>Materials</u>. It is encouraged that recycled material be used when practical as long as it meets the requirements of this specification.
- 3.3.1 Outer shell. The camouflage printed and quarpel treated cotton and nylon twill cloths used for the outer shell for the classes 1 and 3 suits shall conform to the requirements specified in 3.3.1.1 and 3.3.1.2.
- 3.3.1.1 <u>Class 1 suit</u>. The cloth shall be woodland camouflage printed and shall conform to class 2 of MIL-C-44031, except that the colorfastness to laundering (after three cycles) shall rate at least "fair".
- 3.3.1.2 <u>Class 3 suit</u>. The cloth shall be desert camouflage printed (3 color) and shall conform to class 3A of MHL-C-44034.
- 3.3.2 <u>Lining</u>. The laminated cloth used for the lining shall conform to type III of MIL-C-43858 (see 6.5).
- 3.3.3 <u>Butyl cloth</u>. The butyl cloth used for protective pieces beneath all coat and trouser pockets and as reinforcement for elbows and knees shall conform to MIL-C-12189. The heavily coated side of the butyl cloth, when used, shall face to the outside of the coat or trousers. The color shall approximate Olive Drab 177. The colorfastness and dry crocking requirements shall not apply. In addition, the adherability test for lb/inch width, initial, after water immersion, and after heat aging requirements of MIL-C-12189 shall not apply. Initial toxicological agents resistance shall meet the requirements specified in MIL-C-12189 when tested in accordance with 4.4.1.1.
- 3.3.4 <u>Elastic cord</u>. The cotton elastic cord for the drawcord at bottom of coat shall be 3/16 inch in diameter, conforming to class 2 of MIL-C-43303. The color shall be Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Tan 380 for class 3 suit, and the colorfastness requirements shall not apply.
- 3.3.4.1 <u>Elastic cord resin impregnating agent</u>. The resin agent used for dipping or impregnating the ends of the drawcords shall be cellulose acetate or cellulose acetate butyrate to prevent ravelling. The dipped or impregnated ends shall be at least 1/2 inch in length.

3.3.5 <u>Slide fasteners</u>. The slide fasteners shall be continuous element nylon or polyester (spiral type), size MS and in the types and styles indicated. The slide fasteners shall conform to the requirements of V-F-106 before being sewn into the garment. The salt spray test shall not apply. After insertion into the garment, the pin must be able to be fully inserted through slider, seated into box and operable. The closed-end bottom stop shall be a staple type and shall be positioned and sewn, enclosing the sides and ends of the fastener chain. Solid type closed-end bottom stops shall abut the end of the slide fastener chain, and be securely affixed to the slide fastener tape without damage to the tape or chain. The slide fastener pulls shall have a hole with sufficient size to accommodate a 3/8 inch wide thong when a short tab pull is used on the coat front, the tab shall have a minimum length of 7/8 inch.

Coat - Type IV, style 8, long or short tab pull
Trouser fly and leg openings - Type I, style 3 or style 4 (cam
only) short tab pull

3.3.5.1 <u>Slide fastener tape</u>. The color of the slide fastener tape shall be Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Khaki Shade P, Cable Number 66516 for class 3 suit, and the colorfastness requirements shall not apply. The width of the slide fastener tape shall be 9/16 or 5/8 inch.

3.3.6 Braid.

- 3.3.6.1 <u>Leg drawcord</u>. The solid tubular cotton braid for drawcords, at leg bottoms shall conform to type IV, class 2, 4/32 inch diameter of MIL-B-371. The color shall be Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Tan 380 for class 3 suit, and the colorfastness requirements shall not apply.
- 3.3.6.1.1 <u>Drawcord braid resin impregnating agent</u>. The resin agent used for dipping or impregnating the ends of the drawcords shall be cellulose acetate or cellulose acetate butyrate to prevent ravelling. The dipped or impregnated end shall be at least 1/2 inch in length.
- 3.3.6.2 <u>Suspender loops and slide fastener pull thongs</u>. Either braid conforming to type VII of MIL-B-371, or outer shell material (see 3.3.1) may be used for these components. The color shall be Camouflage Green 483 approximating Color Chip 34094 of FED-SID-595, for the class 1 suit, and Tan 380 for class 3 suit, and the colorfastness requirements shall not apply. Cutting and fabrication details when outer shell material is used shall be as specified in table I.
- 3.3.7 <u>Hook and loop fastener tape</u>. The hook and loop fastener tape for securing coat chest pockets, and coat center front overlap shall be 5/8 inch wide hook and loop tape, and for sleeve cuff adjustments, coat pocket flaps, trouser hip pocket flaps and hip pockets shall be 1 inch wide hook and loop

tape conforming to type II, class 1 of MIL-F-21840. The color shall be Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Tan 380 for class 3 suit, and the colorfastness requirements shall not apply.

3.3.8 <u>Tape</u>.

- 3.3.8.1 Adjustment strap tapes. The adjustment strap tape shall be type I, class 3, 5/8 inch width, Camouflage Green 483 approximating Color Chip 34094 of FED-SID-595, for class 1 suit, and Tan 380 for class 3 suit, conforming to MIL-T-43566, except that the colorfastness requirement shall not apply.
- 3.3.8.2 <u>Chest pocket pull tapes</u>. The chest pocket pull tapes, when not cut from ends, shall conform to type I, class 3, 3/8 inch width, Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Tan 380 for class 3 suit, conforming to MIL-T-43566, except that the colorfastness and curvature requirements shall not apply.
- 3.3.9 <u>Snap fasteners</u>. Snap fastener assemblies conforming to MIL-F-10884 shall be used to secure front closure of trousers, to attach the coat back to the trouser back, and to secure trouser cargo pocket flaps. The fasteners to secure trouser closure and trouser cargo pocket flaps shall conform to style 2 or 2A, finish 2. Style 2 shall consist of a 24 line button, size 1 or 2 socket for the female half; and eyelet size 1 or 2, with stud for the male half. Style 2A shall consist of a button, size 1 or 2 and socket for the female half; and eyelet, size 1 or 2, with stud for the male half. The following exception to MIL-F-10884 shall apply: A double stud or as an alternate, style 2 or 2A stud-eyelet combination shall be used on the right side of trousers at waist opening. The snap fasteners for attaching the back of the coat to the trousers shall conform to style 2, finish 2, 24 line size button. The barrel length of button and eyelet shall be selected by the contractor so as to insure a secure clinch of components to material.
- 3.3.9.1 <u>Grommet</u>. The grommets (when applicable) for the coat bottom and trouser leg drawcords shall conform to type II, class 3, size 0 of MIL-G-16491.
- 3.3.10 <u>Buckles</u>. The buckles for hip adjustment straps shall be tongueless, 2 bar, conforming to type II, class 3, style 3, 5/8 inch of MIL-B-543.
- 3.3.11 Gimp. The cotton gimp for reinforcing buttonholes shall conform to type I or II, ticket number 8 of A-A-50198 and the color shall be Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Khaki P-1, Cable No. 66019 for class 3 suit, and the colorfastness requirements shall not apply.

- 3.3.12 Thread, cotton- or polyester-covered, polyester core. The cotton-covered or polyester-covered, polyester core threads for seaming and stitching the coat and trousers shall be ticket numbers 50 and 70, 2 ply conforming to A-A-50199.
- 3.3.12.1 <u>Color</u>. The threads shall be Camouflage Green 483 approximating Color Chip 34094 of FED-STD-595, for class 1 suit, and Khaki P-1, Cable No. 66019 for class 3 suit, and the colorfastness requirements shall not apply. The thread used to sew the laminate cloth for the lining may be white where not exposed to outside.
- 3.3.12.2 <u>Water repellent treatment</u>. The cotton-covered or polyester-covered polyester core threads shall be water repellent treated conforming to type II, class 3 of MIL-T-3530. Lubrication of the quarpel treated thread by any means prior to or during the sewing is prohibited.
- 3.3.13 <u>Labels</u>. All clothing labels shall be in accordance with DDD-L-20. Each of the coats and trousers shall have an identification, a size, and an instruction label. These three labels may be combined. The colorfastness requirements shall not apply.
- 3.3.13.1 <u>Identification label</u>. The identification label shall conform to type VI, class 1 of DDD-L-20, except that the surveillance marking requirements in MIL-C-43858 for the laminated cloth shall appear under the last line of inscription on the label. The surveillance marking may be hand printed or stamped. Size of characters for the lot number shall be a minimum of 10 points affixed with Black (No. 37038) ink conforming to type I of A-A-208.
- 3.3.13.2 <u>Size label</u>. The size label shall conform to type VI, class 2 of DDD-L-20.
- 3.3.13.3 <u>Instruction label</u>. The instruction label shall conform to type VI, class 3 of DDD-L-20 and shall include the following instructive information for each respective size. Instructive information shall be printed in letters not less than a minimum 10 point (approximately 1/8 inch).
 - 1. Wear as outergarment layer of clothing for protection against chemical agents. Should not be worn with underwear only, except in very hot environment.

Number 2 shall be as follows for each separate size:

For size XXX-Small:

2. The multisize system permits the XXX-Small to be worn by the size XX-Small person when only the underwear is worn.

For size XX-Small:

2. The multisize system permits the XX-Small to be worn by the size X-Small person when only the underwear is worn.

For size X-Small:

2. The multisize system permits the X-Small to be worn by the size Small person when only the underwear is worn.

For size Small:

 The multisize system permits the Small to be worn over the X-Small cold-wet uniform or the Small hot weather uniform or by the size Medium person when only the underwear is worn.

For size Medium:

2. The multisize system permits the Medium to be worn over the X-Small cold-dry uniform, the Small cold-wet uniform or the Medium hot weather uniform or by the Large person when only the underwear is worn.

For size Large:

2. The multisize system permits the Large to be worn over the Small cold-dry uniform, the Medium cold-wet uniform or the Large hot weather uniform or by the X-Large person when only the underwear is worn.

For size X-Large:

 The multisize system permits the X-Large to be worn over the Medium cold-dry uniform, the Large cold-wet uniform or the X-large hot weather uniform.

For size XX-Large:

2. The multisize system permits the XX-Large to be worn over the Large cold-dry uniform or the X-Large cold-wet uniform.

For Trousers

- 3. <u>CAUTION</u>: Before entering the water, when wearing the Chemical Protective Suit, the bottoms of the trouser legs should be untied and slide fasteners opened. This action will minimize accumulation of water between the suit and the body.
- 3a. <u>CAUTION</u>: Protection provided by the overgamment is completely degraded in the areas where the overgamment is wet through with fuel, oil or hydraulic fluid.

- 4. Use suspenders, if required, for improved suspension.
- 5. In most circumstances conditions will permit you to remove your footwear prior to donning or doffing these trousers. However, in some conditions of chemical warfare it will be necessary to don and doff your trousers without removal of this footwear. In this event, care must be taken.
- 6. Inspect your leg closure system to insure it is free from dirt and ice, and is firmly compressed to provide adequate closure.
- 7. This suit is not launderable. It may only be laundered for training purposes.

For Coat

- 3. <u>CAUTION</u>: Before entering the water, when wearing the Chemical Protective Suit, the slide fastener should be opened and the bottom untied. This action will minimize accumulation of water between overgarment and the body.
- 3a. <u>CAUTION</u>: Protection provided by the overgarment is completely degraded in the areas where the overgarment is wet through with fuel, oil or hydraulic fluid.
- 4. This suit is not launderable. It may only be laundered for training purposes.

DO NOT REMOVE THIS LABEL

- 3.3.13.4 <u>Combination label</u>. Size, identification, and instruction labels may be combined conforming to type VI, class 14 of DDD-L-20, except that the lot number of the laminated cloth shall appear under the last line of inscriptions on the label and may be hand printed or stamped. The characters for the lot number shall be a minimum of 10 points and shall be printed with Black (No. 37038) ink conforming to type I of A-A-208.
- 3.3.13.5 <u>Fit and size prediction legend</u>. The fit and size prediction legend shall be as specified below. The markings shall be applied to the vapor barrier bag in accordance with 5.4.2.

SUIT, CHEMICAL PROTECTIVE

- (1) Check garment for proper fit. Use the Size Prediction Chart for your approximate size suit. Trade items as required.
- (2) Issue suspenders simultaneously with suit for use if required to aid in suspension of trousers.

- (3) These garments are items of outer wear and can be worn for up to 22 consecutive days. When exposed to chemical agent they will offer protection for at least 24 hours. At the end of 22 days or after 24 hours use in a chemical environment the overgarments are to be replaced.
- (4) When maximum protection is required, wear this suit with Protective Mask and Hood; Glove Set, Chemical Protective; and Footwear Covers, Chemical Protective (Overboots).
- (5) Use this prediction chart to determine the suit size you will need.

Size Prediction Chart

Waist size	Over underwear, long or short	Over battledress uniform	Over coat and trousers cold weather field wear	Over parka and trousers extended cold weather clothing
23	xxx-s	xx-s	x-s	s
27	xx-s	x-s	S	М
31	x-s	S	М	L
35	S	М	L	X-L
39	М	L	X-L	XX-L
43	L	X-L	XX-L	XX-L

3.4 Design.

- 3.4.1 <u>Coat</u>. The coat shall be a hip length design with stand-up collar and full length sleeves with adjustable tab and fastener tapes. Each sleeve shall have an outside one-sided bellows type pocket positioned below an inner atropine carrying pocket with one flap covering both pockets. The coat shall have two side-opening breast pockets, a slide fastener front closure with intermittent fastener tapes and an elastic drawcord in the hem. Each sleeve will have an impermeable elbow patch (see figure 1).
- 3.4.2 <u>Trousers</u>. The trousers shall have a slide fastener front opening with protective flap, two bellow type pockets with flaps located at the side, two hip pockets with flaps, hip adjustment buckles and straps, suspender loops and belt loops. Each leg shall have a slide fastener at the outside to close the gusset opening and a drawcord in the hem. Each leg will have an impermeable knee patch (see figure 2).

- 3.5 <u>Patterns</u>. Standard patterns, which provide 1/2 + 1/8, -0 inch seam allowance for double-lapped and double-stitched seams of coat and trousers, and 3/8 + 1/8, -0 inch seam allowance for single needle seams, except where otherwise specified, will be furnished by the Government. The standard patterns shall not be altered in any way and are to be used as a guide for cutting the contractor's working patterns. The working patterns shall be identical to the standard patterns.
- 3.5.1 <u>List of pattern parts</u>. The components of the suit shall be cut from the materials as specified in accordance with the pattern parts indicated.

Materials	Nomenclature	Cut parts
	COAT	
Outer shell (cotton/nylon	Front	2
cloth)	Back	1
	Collar <u>1</u> /	1
	Top sleeve	2 2 2 2 2 2
	Under sleeve	2
	Chest pocket	2
	Sleeve pocket	2
	Atropine pocket flap	2
	Atropine pocket facing shell	2
	Sleeve tab	2
Lining (laminate cloth)	Front	2
,	Back	1
	Collar 1/	1
	Top sleeve	2
	Under sleeve	2
Butyl cloth	Top sleeve elbow patch	2
	Under sleeve elbow patch	2
	Chest pocket protective piece	2 2 2
	Atropine pocket	2
	Sleeve pocket protective piece	2
	TROUSERS	
Outer shell (cotton/nylon	Front	2
cloth)	Back	2
Cloury	Fly protective flap	2 1 2 2
	Hip pocket	2
	Hip pocket flap	2
	Leg slide fastener covers	4
	Cargo pocket facing	2
	Cargo pocket	2
	Cargo pocket flap	2
	curdo becyer trah	4

Materials	Nomenclature	Cut parts
Lining (laminate cloth)	Front	2
,	Back	2
	Fly protective flap	1
Butyl cloth	Knee patch	2
2101	Cargo pocket protective piece	2
	Hip pocket protective piece	2

- 1/ Collar shell and collar lining utilize same pattern part.
 - 3.6 Construction.
- 3.6.1 Stitches, seams, and stitching. All stitches, seams and stitching shall conform to FED-STD-751. Seam allowances shall be maintained so that no raw edges, runoffs, pleats, or open seams occur. When two or more methods of seams or stitch types are given for the same operation, any one of them may be used. When stitch type 401 is used, the looper (underthread) shall be on the inside of the coat and trousers. The gage for double-lapped and double-stitched seams shall be 1/4 to 5/16 inch.
- 3.6.1.1 Stitch tension. Prior to daily production of the chemical protective suits, the stitch tension of each sewing machine used in the fabrication of foam lining laminate cloth shall be pretested in accordance with the requirements of 3.6.1. Stitch tension on all lining (laminate cloth) seam operations shall be sufficient to compensate for the foam compression and support a 2.0 ounce weighted thickness gage when tested as specified in 4.5.4.
- 3.6.2 <u>Stitches per inch</u>. The minimum and maximum number of stitches per inch shall be as specified in table I.
- 3.6.3 Thread breaks and ends of seams. Ends of all seams and stitching produced with 301 stitch type, when not caught in other seams or stitching, shall be backtacked not less than 1/4 inch and not more than 1/2 inch. Thread breaks, all stitch types, shall be secured by stitching back of the break not less than 1/2 inch and not more than 3/4 inch. Skipped stitches or thread breaks, 401 stitch type, may be repaired using 301 stitch type. Ends of a continuous line of stitching shall overlap not less than 1/2 inch and not more than 3/4 inch.
- 3.6.4 <u>Buttonholes and eyelets</u>. The buttonholes shall be either straight cut type or the eyelet end taper bar type worked over gimp with the purling on the outside and the end of the buttonhole stitching and gimp securely

- 3.6.8 Setting of snap fasteners. When not using an automatic snap fastener setter, a hole shall be prepunched to receive the button and eyelet components of the snap fasteners. The hole shall be smaller than the outside diameter of the button and eyelet barrels so that the barrel must be forced through the hole. The hole shall not be punched in the setting operation with the button or eyelet barrel. The fasteners shall be securely clinched without cutting the adjacent materials and no more than three splits shall occur in the button or eyelet barrels.
- 3.7 <u>Manufacturing operations requirements</u>. The coat and trousers shall be manufactured in accordance with operations listed in table I. Although the contractor is not required to follow the exact sequence of operations, the contractor is required to stitch the identification labels with surveillance marking already handprinted or stamped (see 3.3.13.1) to the lining (as specified in operations 12 and 41 of table I) immediately upon cutting to ensure correct identification and traceability of the cloth. Any basting or holding stitching may be used providing threads or needle holes are not visible on the finished garments. The coat and trousers shall be cut and assembled from the same lot of impregnated cloth.
- 3.7.1 <u>Figures</u>. Figures are furnished for information only. To the extent of any inconsistencies between the figures and the written specification, the written specification shall control.
- 3.8 <u>Use of automated apparel equipment</u>. Automated apparel equipment may be used to perform any of the operations specified in table I, providing that the seam and stitch type are as specified and the finished component conforms to the required configuration. When a government furnished shaper pattern is forwarded, the component shall conform to that pattern.

	TABLE I.		SEAM AND	STITCHES		THREAD	
Š.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
1.	<u>Cutting.</u>						
	a. Cut the coat and trousers in strict accordance with patterns furnished, which show size, directional lines and marks for proper assembly. Unless otherwise specified, the directional lines indicate the warp direction.						
	b. Cut the outer shell (cotton/nylon cloth) parts from one lot of material except fly protective flap, belt loops, suspender loops, sleeve tabs, pocket facings, chest pocket pulls, atropine pocket, and slide fastener thongs which may be cut from ends. Parts cut from ends shall approximate the shade of the outer shell.						
	NOTE: Pocket facings may be cut on rolls.						
	c. Cut all parts of the lining (laminated cloth) from one lot of material. The knit side of laminated cloth is the face of the material (see 6.5.2).						
	d. Directional lines on the patterns for front and back of trousers may vary from the warp direction by not more than 2-1/2 inches. Measurements shall be taken at the top and bottom edges of the pattern from the directional line to the selvage edge of the fabric and the difference between the two measurements shall not exceed 2-1/2 inches.						
	e. Cut the drawcord for leg bottom in 30 ± 1 inch lengths for all sizes.						

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	TABLE	I. (cont'd)	STITCH	SEAM AND STITCHING	STITCHES		THREAD BOBBIN/	
NO. MANUFACTURING OPERATIONS REQUIREMENTS	RATIONS	REQUIREMENTS	TYPE	TYPE	INCH	NEEDLE		COVER
1. Cutting. (cont'd)								
f. Cut the elastic braid for drawco coat in the following lengths (± 1 i		<pre>drawcord at bottom of (± 1 inch tolerance).</pre>						
Size		Inches (relaxed)						
XXX-Small XXX-Small XX-Small		38 38						
A-Small Small Medium		41 44						
Large X-Large XX-Large		44 47 47				·····		
g. Cut the belt loops, suspender loops and slide fastener thongs to conform to the measurements specified in operations 4, 5, and 50.	pender loc to the mea d 50.	ops and slide asurements speci-						
h. Cut the hook and loop portions of mylon fastener tape in the following lengths:	ortions o hs:	f nylon fastener				<u> </u>		
Coat: Chest pocket (2 each of hook and locinches	ok and loc	and loop) 6-1/2 ± 1/8						
Sleeve pocket (4 each of loop) 1-1/2 ± 1/8 inches Atropine pocket flap (4 each of hook) 1-1/2 ± 1/8 inches	xop) 1-1/ th of hoc	2 ± 1/8 inches k) 1-1/2 ± 1/8						
Sleeve tab (2 each of hook) 3-1/2 ± 1/8 inches Sleeve hem (2 each of loop) 4-1/2 ± 1/8 inches Front, right (3 each of hook) 2 ± 1/8 inches Front, overlap, left (3 each of loop) 2 ± 1/8 inches	3-1/2 ± 4-1/2 ± 1/	1/8 inches 1/8 inches /8 inches 9) 2 ± 1/8 inches						
Sieeve hem (2 each of loop) 4-1/2 ± 1/8 inches Front, right (3 each of hook) 2 ± 1/8 inches Front, overlap, left (3 each of loop) 2 ± 1/8	4-1/2 ± 1/8 inches 3k) 2 ± 1/8 inches th of loop) 2 ± 1/8	inches		·				

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1. Cutting. Trousers: Hip pocke Hip pocke Hip pocke i. Cut t straps 3 inch tape following	MANUFACTURING OPERATIONS REQUIREMENTS Cutting. (cont'd) Trousers:	IS REQUIREMENTS	STITCH	CANADA	CEC		PORRTN/	
	ng. (cont'd)	1	TYPE	TYPE	INCH	NEEDLE	LOOPER	COVER
Hip p Hip p i. C strap inch follc	: sae							
Hip p Hip p i. C strap inch follo								
i. C strap inch follo	Hip pocket (4 each of loop) $1 \pm 1/8$ inches Hip pocket flap (4 each of hook) $1 \pm 1/8$ inches	/8 inches 1 <u>+</u> 1/8 inches						
S	i. Cut the 5/8 inch tape for front hip a straps 3 ± 1/4 inches for all sizes. Cut inch tape for back hip adjustment straps following lengths (± 1/4 inch tolerance).	front hip adjustment sizes. Cut the 5/8 ment straps in the tolerance).						
	Size	<u>Inches</u> (relaxed)						
XXX-Small XX-Small X-Small	mall all 11	7-3/4 7-3/4 7-3/4						
Small	=	9-1/4					,	
Large X-Large	æ	9-1/4						
XX-Large	rge	9-1/4						
j. C pocke	j. Cut two lengths of cotton tape for pocket pulls 4 ± 1/4 inches in length.	tape for the chest length.						-
	or				-			
k. Cut ments o length.	from outer shell ends f 3/8 to 1/2 inch wide	for finished measure- and 4 ± 1/4 inches in						
1. T	1. The top sleeve elbow patch, undersleeve elbow patch, atropine pocket, and knee patch shall be cut	ndersleeve elbow patch shall be cut						

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
ပွဲ	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE LOOPER	BOBBIN/ LOOPER	COVER
न	Cutting. (cont'd)						
	from one lot of butyl material. The chest pocket protective piece, sleeve pocket protective piece, cargo pocket protective piece, and hip pocket protective pieces may be cut from ends.						
2.	Replacement of damaged parts.						
	Care shall be exercised during the spreading, cutting and manufacturing operations to assure that material defects and damages, as classified in 4.4.3 are excluded and replaced with nondefective and properly matched material.		·				
m.	Marking.						
	a. The outer shell parts of the suit shall be marked, ticketed or bundled to insure a uniform size and shade throughout the garments. Any method of marking the outer shell parts may be used except:						
	 Metal fastening devices. Sew-on type markings. Adhesive type tickets which discolor the material or leave traces of paper or adhesive upon removal of tickets. Punched or drill holes. 						
	b. The lining material parts of the suit shall be marked and bundled to insure a uniform size throughout the garments. Each bundle shall have the surveillance number clearly identified. Only one surveillance number can be used in a uniform.						

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
9	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	MEEDLE	BORBIN/ LOOPER	COVER
m,	. Marking. (cont'd)						
	c. The butyl cut parts shall be bundled after the heavy side is marked to insure, when attached to the areas to be protected, the heavy side shall face toward the outside of the suit.						
4	Make seven belt loops, two suspender loops and three slide fastener thongs (see operation 1g).						
	a. Fold under side raw edges with edge abutted or overlapped and double stitch length of stripping, with the stitching 3/16 to 5/16 inch gage, using a cover stitch on the underside.	406	EFh-1	6-10	20	20	
	or						
	b. Fold stripping in half lengthwise with the raw edges turned in and stitch 1/16 to 1/8 inch from each edge.	301	EPp-2	10-14	20	20	
	c. The loops and thongs shall finish 3/8 to 1/2 inch in width.						
5.	Attach thongs to slide fastener pulls on trousers (see operation 4).						
	a. Cut the thongs in 6 ± 1/4 inches length.						
	b. Thread one end of thong through end of slide fastener pull and with ends even, secure the ends with a bartack.	Bartack		28 per bartack	20	20	
	JO.						

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	TARLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
ġ	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	MEEDLE	BOBBIN/ LOOPER	COVER
5.	Attach thongs to slide fastener pulls on trousers (see operation 4). (cont'd)						
	c. Fold length of thong in half. Insert loop end through the end of the pull. Pass the two free ends through the loop and pull up tight.						
	NOTE: Pull thongs are not required on coat slide fastener pull.						-
	MAKE COAT						
9	Make collar.						
	Position outer shell of collar and collar lining face to face and stitch along top and side edges. Turn, work out edges and stitch 1/4 to 5/16 inch from top and side edges.	301 or 401 and 301	SSe-2(a) SSe-2(b)	8-10	2000	500	
7.							
	Turn front edges of pocket to inside and place hook portion of mylon fastener tape on inside of pocket, positioned as indicated on pattern. Fold a piece of 3/8 inch cotton tape in half lengthwise (for chest pocket pull), if using material ends for chest pocket pulls construct as specified in operation 4 and place between fastener tape and pocket, at the midpoint of the fastener tape. Stitch 1/8 to 3/16 inch from edges of fastener tape catching the pocket pull on both sides.	301 or 401	LSbj-1	10-14	20 00	50 70	

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
7.	Make chest pockets. (cont'd)						
	NOTE: When the operation is completed, the pocket pull shall be caught securely between the two long rows of stitching attaching the fastener tape to the pocket.						
œ	Attach chest pocket protective piece to outer shell.	1 1					
	Position chest pocket protective piece with heavily butyl coated surface facing outward on the finished garment on front outer shell where indicated on pattern. Stitch 1/16 to 1/8 inch from all edges. Place loop portion of nylon fastener over the protective piece, positioned as indicated on front pattern. Stitch 1/8 to 3/16 inch from each edge of tape.	301	LSbj-1	10-14	20	20	
	NOTE: When using a double needle machine for operations 7 and 8 for attaching fastener tapes, it is only necessary to stitch along the longer sides of the fastener tape.						
9.	Attach chest pockets to front outer shell.						
	Position chest pockets over the chest pocket protective piece matching hook and loop portion of mylon fastener. Turn under and stitch the remaining front pocket sides, as well as all other pocket sides 1/16 to 1/8 inch from turned under edges.	301 Bartack	LSd-1	10-14 28 per bartack	50	20	
	Frace a norizontal bartack at each end of the pocket opening. The protective piece shall not extend beyond the sides and bottom edges. Pocket opening shall be a minimum of 5-7/8 inches.				·		-1

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TARTE (CONT. D.)
STITUTE STITUTE STITUTE
MANUFACTURING OPERATIONS REQUIREMENTS
Attach hook fastener tape to outer shell center front edge.
Position hook fastener tapes on right coat front (shell only) as indicated on pattern and stitch 1/8 to 3/16 inch from all edges.
Join shoulder seams of outer shell.
Join shoulder seams with a double-lapped and double-stitched seam with fronts overlapping backs.
Sew identification, size, and instruction label, or combination label 1/8 to 3/16 inch from the edge on on all four sides to the knit side of lining on right front with bottom edges 1-1/4 ± 1/4 inches from bottom edge of front and positioned as follows:
(1) Size or combination label - centered $(\pm 1/2)$ inch tolerance) on right front.
(2) Identification label (when used) - positioned to left of size label with nearest side edges abutted. The nearest side edges may be overlapped and caught in one row of stitching
(3) Instruction label - positioned to the right of size label with nearest side edge abutted. The nearest side edges may be overlapped and caught in one row of stitching.

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	1									
THREAD BOBBIN/				50 70		50	50	20		
NEFT				50		20 20	50	20		
STITCHES PER INCH		·		8-10		10-14	8-10	8-10		
SEAM AND STITCHING				LSq-2		SSa-1	SSe-2(a)	SSe-2(b)	·	
STITCH				301 or 401		301 or 401	301 or 401	301		
TARLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	Labels. (cont'd)	NOTE: Final row of stitches on overlapped edges may be continued to bottom of lining.	Join shoulder seams of lining.	Position lining fronts and backs face to face and join shoulder seams. Turn seam allowances to one side and raise stitch 3/16 to 1/4 inch from turned edges.	Attach collar.	a. Position collar to outer shell of coat, face to face, and join along neck edge from notch to notch as indicated on pattern.	b. Position lining to outer shell, face to face, with fronts and neck edges even, and join plies along front edges with the stitching continued along entire neck edge including collar.	c. Turn coat to right side out, work out edges, and edge stitch fronts 1/4 to 5/16 inch from front edges with the stitching continued across the entire neck edge 1/4 to 5/16 inch from collar seam.	 d. When "c" above is completed, the edge of the collar, right and left front, shall finish 2-1/8 ± 1/8 inches from finished front edge. 	
Q	12.		13.		14.					

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COVER									·
THREAD BOBBIN/ LOOPER		20		20	20			20 20 20 20	50.
A ICEDIA		S S		20	20		20	0	20
STITCHES PER INCH		10-14		10-14	10-14		19-24 per eyelet 26-32 per eyelet	26-32 per eyelet	10-14
SEAM AND STITCHING TYPE		LSbj-1		LSa-1	LSbj-1				EFb-1
STITCH		301		301	301		401 or 502 or	503	301 or 401
TABLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	Attach elbow patches to outer shell.	a. Position the under sleeve elbow patch on the wrong side of the under sleeve and stitch 1/16 to 1/8 inch around edges as indicated on the pattern. In a similar fashion position the top sleeve elbow patch on the wrong side of the top outer shell sleeve as indicated on pattern and stitch 1/16 to 1/8 inch around the edge.	or	b. Stitch under sleeve elbow patch to top sleeve elbow patch. Overlap shall be 1/2 inch.	c. The one piece elbow patch assembly shall be positioned, as indicated on pattern (to wrong side of outershell) after underarm seam is stitched. Stitch 1/16 to 1/8 inch around the edge.	Make sleeve pocket.	a. Make one 3/16 to 1/4 inch buttonhole or sewn eyelet at bottom of each sleeve bellows pocket, positioned as indicated on pattern.		b. Turn top edge of pocket to inside, as indicated on the pattern, and with the raw edge turned in, single stitch 1/16 to 1/8 inch from edge. The hem shall finish 1 ± 1/8 inches wide.
ġ	15.					16.			

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
δ.	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	STITCHING	PER	NEEDLE LOOPER	BOBBIN/ LOOPER	COVER
18.	Make atropine pocket flap.						
	a. Fold the atropine pocket flap lengthwise and stitch 3/8 ± 1/16 inch seam on each end. Turn the flap working out the corners, and place a row of stitching 1/4 ± 1/16 inch on the closed sides of the flaps, and continue along the folded edge.	301 or 401 and 301	SSe-2(a) SSe-2(b) and OSf-1	10-14 10-14	50	000	
	b. Position hook portion of the nylon fastener tape on atropine pocket flap as indicated on pattern and stitch 1/8 to 3/16 inch from all edges.	301	LSbj-1	10-14	20	20	
19.	Make atropine pocket and opening.				•		
	 a. Position butyl pocketing on sleeve liner (foam side) and stitch around opening, as indicated on pattern. 	301	SSa-1	10-14	20	20	
	b. Tongue notch opening and turn pocketing to inside. Topstitch 1/8 ± 1/16 inch from folded edge. The opening is to finish 3/4 +1/4, -1/16 inch wide.	301	SSa-1	10-14	20	20	
	c. Position pocket facing shell on topsleeve and stitch around opening, as indicated on pattern. Insert pocket flap catching flap in stitching.	301	SSa-1	10-14	50	50	
	d. Tongue notch pocket opening. Turn facing to inside and topstitch 1/8 ± 1/16 inch from all four edges.	301	SSa-1	10-14	20	50	-
	e. Superimpose topsleeve pocket opening on top of lining opening. Stitch lower pocket openings together and ends of pocket opening 1/8 ± 1/16 inch from edge.	301	SSa-1	10-14	50	20	

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Ď.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	BOBBIN, NEEDLE LOOPER	BOBBIN/ LOOPER	COVER
19.	Make atropine pocket and opening. (cont'd)						
	f. Close the top and sides of opening by folding down the outershell sleeve and stitching thru the facing and flap raw edges while penetrating sleeve liner and butyl pocketing.	301	SSa-1	10-14	50	20	
	g. Fold butyl pocketing up, so that the top and bottom edges are even, and stitch pocketing to liner 1/8 to 1/4 inch from edge on all four sides.	301	SSa-1	10-14	20	50	
	h. When this operation is complete the pocket depth shall finish 6 ± 1/2 inches.			·			
	NOTE: When this operation is complete and the fastener tapes are engaged, the atropine pocket flap should not lay flat. (The blouse effect is to accommodate the atropine kit.)						
	or						
	1. Superimpose topsleeve shell (face side up) on topsleeve lining (foam side up). Position atropine flap on shell, position butyl pocket on flap and shell and stitch with 2 rows of stitching 3/4 inch apart thruall plies, catching flap in top row of stitching.	301	SSa-1	10-14	50	50	***************************************
	j. Tongue notch as indicated on pattern, turn butyl pocket thru opening to inside and topstitch 1/8 ± 1/16 inch from folded edge of opening on all four sides. Opening is to finish 3/4 +1/4, -1/16 inch wide.	301	SSa-1	10-14	20	50	
	k. Fold butyl pocketing up so that the top and side edges will be even and stitch pocket to lining 1/8 to	301	SSa-1	10-14	20	20	

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THREAD BOBBIN/ LOOPER COVER						20	20 20	20 00	50 50	50 50 70 50
NEEDLE LO					20	20	·	20	20	
STITCHES PER INCH					10-14	10-14	·····	10-14	8-10	
SEAM AND STITCHING TYPE					SSc-1	LSbj-1		LSbj-1	SSa-1	
STITCH					301	301		301	301. or 401	
TABLE I. (cont'd) MANJFACTURING OPERATIONS REQUIREMENTS	Make atropine pocket and opening. (cont'd)	$1/4$ inch from edge on all four sides. When this operation is complete, the pocket depth shall finish 6 \pm 1/2 inches.	NOTE: When this operation is complete, the fastener tapes are engaged, the atropine pocket flap should not lay flat. (The blouse effect is to accommodate the atropine kit).	Make sleeve tabs.	a. Fold under both long raw edges along the seam line and then fold crosswise leaving one raw edge 3/8 + 1/16 inch shorter than the other. Stitch 1/8 to 3/16 inch from the edge of the tab.	b. Position hook tape on each tab as indicated on the pattern and stitch 1/8 to 3/16 inch from all edges.	Join sleeves.	a. Position loop tape on top sleeve shell as indicated on pattern and stitch 1/8 to 3/16 inch from all edges.	b. Position the raw edge of the sleeve tab even with the raw edge of the top sleeve as indicated on the pattern taking care to keep the hook and loop in alignment. Stitch 1/8 to 3/16 inch from edge.	
NO.	19.			20.			21.			

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
ğ	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
21.	Join sleeves. (cont'd)						
	sleeve outer shell with a double-lapped, double-	301 or	LSc-2	10-14	20	20	
	sleeve.	401			50	70	
	d. At back arm, join the top sleeve lining to the under sleeve lining with a 1/2 +1/8, -0 inch seam.	301 or 401	SSa-1	8-10	50	50	
22.	Set sleeves.)		
	a. Join the outer shell sleeve to the outer shell coat with a double-lapped, double-stitched seam. The coat shall overlap the sleeve.	301 or 401	ISc-2 ISc-2	10-14 10-14	50	50	
	b. Join sleeve lining to coat lining with a 1/2 + 1/8, - 0 inch seam.	301 or 401	SSa-1 SSa-1	8-10 8-10	50 0	50	
	c. Position sleeve tab parallel to raw edge of under sleeve hem located where indicated on the pattern such that the raw edges of the sleeve tab and the raw edge of the under sleeve are even.				•		
	d. In one operation join the outer shell underarm and outer shell side body seams with a double-lapped, double-stitched seam. The front shall overlap the back and the raw edge of the sleeve tab shall be securely caught in the seam.	301 or 401	LSc-2 LSc-2	10-14	50	50	
	e. Turn sleeve tab back over the seam and raise stitch 1/2 to 5/8 inch from the turned edge.	301	SSD-1	10-14	20	50	
	or						
					-	-	_

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Ĺ							
	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Š	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
22.	Set sleeves. (cont'd)						
	f. As an alternate to c., d. and e. above, the sleeve tab may be stitched to the undersleeve, located as indicated on the pattern, however, with the raw edge of the tab 3/8 + 1/8, - 0 inch from the raw edge of the under sleeve.	301 or 401	SSa-1	8-10	20	50	
	g. After joining the underarm and side seams of the outer shell, as specified in d. above, turn tab back and raise stitch as specified in e. above.						· · · · · · · · · · · · · · · · · · ·
	h. In one operation, join the lining underarm and side body seams with a $1/2 + 1/8$, - 0 inch seam.	301 or 401	SSa-1 SSa-1	8-10 8-10	50	50	
	NOTE: When completed, the sleeve tabs will fasten from front to back. Cuff adjustments shall be stitched through the shell cloth only.						
23.	Finish sleeve bottoms.						
<u>.</u> 1	With lining even with the finished hem of the outer shell, turn in bottom edge of outer shell as indicated on pattern. Fold in raw edges of outer shell 1/4 ± 1/16 inch and stitch hem completely around the bottom from the turned edge.	301	SS1-1	10-14	20	20	
24.	Finish the bottom of coat.						
	a. Place two metal growmets as indicated on pattern.		-				
	or						

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Š	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	INCH ENCH	3 ICEGN	BOBBIN/ LOOPER	COVER
24.	· Finish the bottom of coat. (cont'd)						
·	b. Make two buttonholes or sewn eyelets at the bottom of coat as indicated on pattern in lieu of	401 or 502 or		19-24 per eyelet	20	50 or	
	inclar eyelets.	503		26-32 per eyelet	70	50 or	
				26-32 per eyelet	70	50 or	
	c. Position the elastic drawcord on inside of coat with ends exiting through eyelets and knot ends of drawcord.						
	d. Turn up bottom edge of outer shell even with the lining and with the raw edge turned in stitch 1/8 to 3/16 inch from turned edge with the stitching contin-	301	SS1-1	10-14	20	20	
·	uing along the complete bottom. The hem shall finish 1-1/4 ± 1/8 inches from the bottom edge of the coat.				,		
	e. Center the elastic drawcord in the hem of the coat. In the center back, place a vertical bartack through the hem catching the waist drawcord.	Bartack		28 per bartack	50	20	
25.	Attach slide fastener.						
	a. Position the back edge of the slide fastener tape on the inside of the left front, 2-1/2 ± 1/8 inches from the finished front edge, as indicated on the pattern, with top stop 1/2 to 5/8 inch from the top.						
	b. Starting at bottom of tape, stitch tape to coat 1/16 to 1/8 inch from back edge, to the top of tape and continue across the turned under end.	301	LSbj-1	10-14	20	20	
							-

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COVER									
THREAD BOBBIN/ LOOPER		20		20	20	50		20	
NEEDLE		20		20	20	20		20	
STITCHES PER INCH		10-14		10-14	10-14	10-14		28 per bartack	
SEAM AND STITCHING TYPE		LSbj-1		or ISbj-1	LSd-1 or LSbj-1	LSd-2			
STITCH		301		301	301	301		Bartack	
TABLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	. Attach slide fastener. (cont'd)	c. Place a second row of stitching through tape and coat positioned 1/4 to 5/16 inch from the first row of stitching.	 d. Position the back edge of the slide fastener tape (tape containing slider) on outside of right front 1-7/8 ± 1/8 inches from the finished front edge, with the top stop 1/2 to 5/8 inches from the top. 	e. Starting at bottom of tape, stitch tape to coat 1/16 to 1/8 inch from back edge to the top of coat and continue across the turned under end.	f. Place a second row of stitching through tape and coat positioned 1/4 to 5/16 inch from the first row of stitching.	g. When using a double needle machine, turn the coat and continue stitching across the turned under ends of the tape (perpendicular to the slide fastener) and backtack to secure, forming a boxstitch.	or	h. Bartack across the turned under ends of the tape (perpendicular to the slide fastener).	
Q Q	25.								

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
NO.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
26.	Attach loop tape fasteners.			·			
	Position loop tapes on lining side of coat on left center front as indicated on pattern and corresponding to hook tapes on coat right center front. Stitch 1/8 to 3/16 inch from all edges, through all thicknesses.	301	LSbj-1	10-14	20	20	
27.	Attach snap fasteners.		·				
	Place a female portion snap fastener on the outside of the center back coat bottom, and two additional female snap fasteners, $3 \pm 1/8$ inches from each side of center back. These fasteners are to be positioned 1-1/4 ± 1/8 inches from bottom of the coat.						
	NOTE: The center snap fastener may be located off center (to either side) enough to allow the male portion to be located just off the trouser back seam.						7
	MAKE TROUSERS		•				
28.	Make fly protective flap.			-			
	a. Join outer shell and lining piece of protective flap along side and bottom edges, face to face. Turn, work out edges and stitch 3/16 to 1/4 inch from turned edges, with stitching continued to the top edge of outer shell material.	301 or 401	SSe-2(a) SSe-2(b)	10-14	000	20	

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MANUFACTURING OPERATIONS REQUIREMENTS WANUFACTURING OPERATIONS REQUIREMENTS Type Type	COVER				
MANUFACTURING OPERATIONS REQUIREMENTS Make fly protective flap. (cont'd) 1. TTPE Make fly protective flap. (cont'd) 1. TTPE Make fly protective flap. (cont'd) 1. TTPE 1. TTPE Make fly protective flap. (cont'd) 1. TTPE 1. TTPE		50	50 50	50 or 70 or 70 or 70 or	ري د
TARLE I. (cont'd) STITCH STRINGHING WANUFACTURING OPERATIONS REQUIREMENTS Make fly protective flap. (cont'd) b. Turn in top edge of outer shell even with the raw addes of lining and stitch 1/16 to 1/8 inch from turned edge with the stitching continued along side and top edges of hem. The hem shall finish 1/2 to 5/8 inch in width. Make cargo pocket flap. Fold cargo pocket flap. Fold cargo pocket flap lengthwise and stitch a 1/4 to 301 or 58e-2(a) out the corners and place a row of stitching 1/4 to 301 or 58e-2(a) out the corners and place a row of stitching 1/4 to 301 or 58e-2(a) out the corners and place a row of stitching 1/4 to 301 or 58e-2(a) out the corners and place a row of stitching 1/4 to 301 or 58e-2(a) out the corners and place a row of stitching 1/4 to 500 or 500 or 1/4 inch sewn eyelet at bottom 502 or patterns. a. Make one 3/16 to 1/4 inch sewn eyelet at bottom of each cargo pocket, positioned as indicated on patterns. b. Fold the two front pleats at marks indicated on pattern and stitch along the fold, 1/8 to 3/16 inch from the edge. NOTE: Pleats shall fold toward the back of pocket as indicated on pattern.		20	50 50 50 50	50 70 70	20
MANUFACTURING OPERATIONS REQUIREMENTS Make fly protective flap. (cont'd) b. Turn in top edge of outer shell even with the raw edge of lining and stitch 1/16 to 1/8 inch from turned edge with the stitching continued along side and top edges of ham. The hem shall finish 1/2 to 5/8 inch in width. Make cargo pocket flap. Fold cargo pocket flap lengthwise and stitch a 1/4 to 1/16 inch seam on each end. Turn the flap working out the corners and place a row of stitching 1/4 to 5/16 inch on the closed sides of the flap and continue along the folded edge. Make cargo pocket. Make cargo pocket. Make cargo pocket plap lengthwise and stitch a 1/4 to 5/16 inch on the closed sides of the flap and continue along the folded edge. Make cargo pocket, positioned as indicated on patterns. b. Fold the two front pleats at marks indicated on patterns. b. Fold the two front pleats at marks indicated on pattern. NOTE: Pleats shall fold toward the back of pocket as indicated on pattern.	STITCHES PER INCH	10-14	10-14 10-14 10-14 10-14	19-24 per eyelet 26-32 per eyelet 26-32 per eyelet	10-14
Make flv protective flap. (cont'd) b. Turn in top edge of outer shell even with the raw edge of lining and stitch 1/16 to 1/8 inch from turned edge with the stitching continued along side and top edges of hem. The hem shall finish 1/2 to 5/8 inch in width. Wake cargo pocket flap. Fold cargo pocket flap lengthwise and stitch a 1/4 in width. Fold cargo pocket flap lengthwise and stitch a 1/4 out the corners and place a row of stitching 1/4 to 301 the corners and place a row of stitching 1/4 to 5/16 inch on the closed sides of the flap and continue along the folded edge. Wake cargo pocket, positioned as indicated on patterns. a. Make one 3/16 to 1/4 inch sewn eyelet at bottom of each cargo pocket, positioned as indicated on patterns. b. Fold the two front pleats at marks indicated on patterns. b. Fold the edge. NOTE: Pleats shall fold toward the back of pocket as indicated on pattern.	SEAM AND STITCHING TYPE	SS1-1	SSe-2(a) SSe-2(a) SSe-2(b) and OSf-1		08f-1
	STITCH	301		401 or 502 or 503	301
30 29.	TABLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS			o 1/4 inch t, positior	Fold the two front pleats tern and stitch along the 1 m the edge. E: Pleats shall fold towar as indicated on pattern

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Š	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING TYPE	PER	NEEDLE	BOBBIN/ LOOPER	COVER
30.	Make cargo pockets. (cont'd)						
	c. Stitch across top and bottom of pleats to hold in position.	301 or 101 or 401	SSa-1 SSa-1 SSa-1	6-14 6-14 6-14	20 00	50	
	d. With top raw edges of facing and pocket turned under, stitch facing to top inside of pocket, 1/16 to 1/8 inch from edge.	301 or 401	LSK-2 LSK-2	10-14 10-14	20 02	50	
	NOIE: This operation may be performed with automated folders using facings cut off rolls. No more than one splice per facing.						
	or						
	e. Stitch the facing to the top of pocket, turn and edge stitch 1/16 to 1/8 inch from top edge.	301 or 401 and 301	SSe-2 SSe-2 SSe-2	10-14 10-14 10-14	20 20	50 50 50	
	f. After either of the options, turn in bottom raw edge of facing and stitch to pocket 3/32 to 1/8 inch from the folded edge.	301 or 401	LSK-2 LSK-2	10-14 10-14	50	50	
	g. Bartack horizontally across fold of pleats. The bartacks shall be not more than 1/8 inch from the lower row of facing stitching.	Bartack		28 per bartack	20	20	
	h. Fold outside edge of bellows and stitch along folded edge (through facing 1/16 to 1/8 inch from folded edge). Place a vertical bartack, 1/8 ± 1/32 inch from top of pocket with bartack superimposed on stitching.	301 and bartack	OSf-1	10-14 28 per bartack	500	500	

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•	TARGE I. (cont'd)		SFAM AND	STITUTES		THREAD	
ġ	땔	STITCH	STITCHING	PER	ALEEDI E		COVER
20.	Make cardo					_	
		301 or 401	LSd-1	6-14	50	50	
31.	allowance in the stitching. Make hip pocket and hip pocket flap.						
	a. Turn top edge of pocket to inside, as indicated on pattern, and with the raw edge turned under 1/4 inch, single stitch 1/16 to 1/8 inch from edge. The hem shall finish 3/4 ± 1/16 inch in width.	301 or 401	EPD-1	10-14	50	20	
	b. Position the loop portion of the nylon fastener tape to the pocket, as indicated on pattern, and stitch 1/8 to 3/16 inch from all edges.	301	LSbj-1	10-14	20	20	
,	c. Fold hip pocket flap in half lengthwise and join side edges. Turn flap, work out edges and stitch 1/4 to 5/16 inch on the closed sides of the flap and continue along the folded edge.	301 or 401 and 301	SSe-2(a) SSe-2(a) SSe-2(b) and OSf-1	10-14 10-14 10-14	2000	50 50 50	
	d. Position the hook portion of the nylon fastener tape to the pocket flap, as indicated on pattern, and stitch 1/8 to 3/16 inch from all edges.	301	LSbj-1	10-14	20	20	
32.	Attach knee patch to the front outer shell. Position the knee patch on the wrong side of front outer shell as indicated on the pattern and stitch 1/16 to 1/8 inch from all edges.	301	I.Sbj-1	10-14	20	20	

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Š.	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
33.	Join trouser fronts to backs at sides.						
	Join the outer right front shell to outer right back shell with a double-lapped, double-stitched seam, the front to overlap the back. In similar fashion join the left front outer shell to the left back outer shell, the front to overlap the back.	301 or 401	LSc-2	10-14	20	50	
34.	Attach cargo pocket protective piece to outer shell.		,				
	Position cargo pocket protective piece as indicated on pattern, and stitch 1/16 to 1/8 inch in from all edges.	301	LSbj-1	10-14	20	20	
35.	Attach cargo pockets and flaps to outer shell.						
	Finished appearance. The bellows side of the cargo pocket shall finish toward the back. Pockets shall be uniformly stitched and properly positioned with the top corners of pocket openings covered by the flap. The edges of the cargo pocket protective piece shall not extend beyond the edges of the bellows pocket and flap.						
	a. Mark position of cargo pockets and flaps, as indicated on the patterns.						
	b. Turn in the seam allowance on the bellows side of pocket. Stitch bellows side of pocket to trousers, positioned as marked, with one row of stitching 1/16 to 1/8 inch from edge. The end of the seam shall catch the turned-under seam allowance at bottom of pocket, closing bellows at bottom.	301	I.Sd-1	10-14	20	20	

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				···			
COVER							
THREAD BORBIN/ LOOPER		20		20	20		50
Aloeen		20		20	20		20
STITCHES PER INCH		10-14		28 per bartack	10-14		10-14
SEAM AND STITCHING TYPE		1.5d-1			LSb1-2		rsd-2
STITCH		301		Bartack	301	***	301
TABLE I. (cont'd) MANUFACTURING OPERATIONS REQUIREMENTS	Attach cargo pockets and flaps to outer shell. (cont'd)	c. Turn in other side and remaining bottom seam allowance of pocket and stitch to trousers with one row of stitching 1/16 to 1/8 inch from edge to bellows side.	NOTE: Operations 35.b. and 35.c. may be performed in one operation to attach the cargo pocket. When using the single operation, the back bottom corner of each cargo pocket shall be backtacked through all layers for not less than 1/4 inch, and continue to stitch up the back side, pivoting at the corner such that the crossover stitch is immediately after the backtack to preclude any weak spot in this area.	d. Bartack back and front edges of pocket opening with vertical bartacks in line with pocket stitching through pocket and trousers.	e. Position raw edges of cargo pocket flap above pocket opening as indicated on pattern, and stitch 3/16 to 1/4 inch from raw edges. Turn flap down and raise stitch 1/4 to 5/16 inch from turned edge, burying the raw edges within the seam.	or	f. Turn in top raw edge of flap, positioned on trousers as indicated on pattern, and double-stitch burying raw edges within seam.
9	35.						

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CHREAD	NEEDLE		50 50		50 50		20 20	20	
STITCHES	PER		28 per bartack		10-14		10-14	10-14	
SEAM AND	STITCHING				LSbj-1		LSd-1	I.Sb]-2	
	STITCH		Bartack		301		301	301	
TABLE I. (cont'd)	MANUFACTURING OPERATIONS REQUIREMENTS	Attach cargo pockets and flaps to outer shell. (cont'd)	g. Bartack lower front corner of pocket flap with a vertical bartack 1/16 to 1/8 inch from side and bot- tom edges through pocket flap, pocket and trousers.	Attach hip pocket protective piece.	Position hip pocket protective pieces as indicated on pattern and stitch 1/16 to 1/8 from all edges to back outer shell.	Attach hip pockets and flaps to outer shell.	a. Position hip pocket as indicated on pattern, turn in sides and bottom edges of hip pocket and stitch 1/16 to 1/8 inch from the edges. The protective plece shall not extend beyond side and bottom edges of pocket.	b. Position raw edges of hip pocket flap above pocket opening as indicated on patterns and stitch 3/16 to 1/4 inch from raw edges. Turn flap down and raise stitch 1/4 to 5/16 inch from the turned edge, burying the raw edges within the seam. The protective piece shall not extend beyond top and side edges of flap. The side edges of flap shall align with the side edges of the pocket within ± 1/8 inch.	
	S	35.		36.		37.			

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	COVER							,	
THREAD	BOBBIN/ LOOPER		50	20 20		50			50
	TICEEN		20 02	00 00		50			50
STITICHES	PER		10-14	10–14		10-14			10-14
SEAM AND	STITCHING		SSa-1	LSd-1		LSd-1			<u>ISq-3</u>
	STITCH		301 or 401	301 or 401		301 or 401			301 or 401
TABLE I. (cont'd)	MANUFACTURING OPERATIONS REQUIREMENTS	Make slide fastener cover for the leg adjustment.	a. As indicated on pattern, join slide fastener cover, face to face, with $1/2 \pm 1/32$ inch seam for $2 \pm 1/8$ inches from top.	b. Position slide fastener below seam and to inside of each opening with raw edges turned under, and with top slide stop 2-3/4 ± 1/8 inches from open end of slide fastener cover. Turn under slide fastener tapes at top slide stop and stitch slide fastener cover 3/8 ± 1/32 inch from opening with stitching extending around both sides and top forming a U-shape.	Attach slide fastener and cover to outer seam of outer shell pant leg.	Place slide fastener and cover in an open position on the outer shell, with the functional side of the assembly located at the markings indicated on the pattern. Turn in edges and raise stitch 1/16 to 1/8 inch around the edges.	NOTE: When slide fastener is closed the leg opening will be narrower and the slider shall be toward the bottom of the trouser leg.	Join crotch, seat and inseams of outer shell.	a. Position left front to right front at crotch and join the crotch seam beginning at the inseam and continuing for 2-7/8 ± 1/8 inches, stopping at notch as indicated on pattern. The seam allowance may be folded to either side. The top ply shall be turned
	Š.	38.			39.			40.	

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	TARLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Š	MANUFACTURING OPERATIONS REQUIREMENTS	STITCH	STITCHING	PER	TICEEN	BOBBIN/ LOOPER	COVER
40.	Join crotch, seat and inseams of outer shell. (cont'd)						
	sharply back over the first row of stitching, showing the face of the shell fabric. Two rows of stitching shall be placed at 1/8 and 1/4 inches from crotch seam on side of the seam allowance.						
	or						
	b. Stitch with a double needle machine.	301 or 401	LSc-2	10-14	20	50	
	c. Join seat seam of outer shell with double-lapped and double-stitched seam. The seat seam may lap either direction.	301 or 401	LSc-2	10-14	20 00	50	
	d. Join inseams with a double-lapped and double-stitched seam and the front will overlap the back.	301 or 401	LSc-2	10-14	20 20	50 70	
41.	1. Make trouser lining (laminate material).						
	Join side seams, crotch seam to notch, seat seam and inseams of trouser lining, stitch all seams with material face to face (knit side to knit side).	301 or 401	SSa-1	8-10	20 00	50	
42.	2. Attach label.						
·	Sew identification, size, (combination identification, size, and instruction label, when used) and instruction label 1/8 to 3/16 inch from edge on all four sides to the knit side of left back of lining material (positioned as indicated below) with the top edges 3-1/8 ± 1/8 inches below top edge.	301	LSbj-1	8-10	20	20	

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301 SSC-1 10-14 50 50	10-14 50
SSC-1	SSC-1
301	301
·	
(2) Identification label (when used) - positioned to left of size label with nearest side edges abutted. The nearest side edges may be overlapped and caught in one row of stitching. (3) Instruction label - positioned to the right of size label with nearest side edges abutted. The nearest side edges may be overlapped and caught in one row of stitching. NOTE: Final row of stitches on overlapped edges may be continued to top of lining. Join outer shell and lining at front opening. Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly.	(2) Identification label (when used) - positioned to left of size label with nearest side edges abutted. The nearest side edges may be overlapped and caught in one row of stitching. (3) Instruction label - positioned to the right ossize label with nearest side edges abutted. The nearest side edges may be overlapped and caught in one row of stitching. NOTE: Final row of stitches on overlapped edges may be continued to top of lining. Join outer shell and lining at front opening. Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly. Attach slide fastener to fly opening.
(3) Instruction label - positioned to the right ize label with nearest side edges abutted. The learest side edges may be overlapped and caught in me row of stitching. OTE: Final row of stitches on overlapped edges m be continued to top of lining. Insert lining into the outershell, turn raw edge under 3/8 inch on outershell and lining between slies at front opening and stitch 1/16 to 1/8 inch rom folded edge. The stitching shall continue to the top edge of the outershell and shall terminate it the notch at base of fly.	(3) Instruction label - positioned to the right ize label with nearest side edges abutted. The learest side edges may be overlapped and caught in me row of stitching. OTE: Final row of stitches on overlapped edges m be continued to top of lining. Oin outer shell and lining at front opening. Insert lining into the outershell, turn raw edge under 3/8 inch on outershell and lining between slies at front opening and stitch 1/16 to 1/8 inch rom folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly.
NOTE: Final row of stitches on overlapped edges may be continued to top of lining. Join outer shell and lining at front opening. Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly.	NOTE: Final row of stitches on overlapped edges may be continued to top of lining. Join outer shell and lining at front opening. Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly. Attach slide fastener to fly opening.
Join outer shell and lining at front opening. Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly.	Join outer shell and lining at front opening. Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly. Attach slide fastener to fly opening.
Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly.	Insert lining into the outershell, turn raw edges under 3/8 inch on outershell and lining between plies at front opening and stitch 1/16 to 1/8 inch from folded edge. The stitching shall continue to the top edge of the outershell and shall terminate at the notch at base of fly. Attach slide fastener to fly opening.
	Attach slide fastener to fly opening.

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SEAM AND STITCHES THREAD STITCHING PER INCH INCH INCH INCH INCH INCH INCH INCH	
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40 · 70 70 1J	and with to 1/8 timued s of the st
MANUFACTURING OPERATIONS REQUIREMENT Attach slide fastener to fly opening. (cont'd) row 1/8 to 3/16 inch from the first row. The stop shall finish 1-3/8 ± 1/8 inches from top of finished waist. If slide fastener is place outside the right front; the top end of faster shall be turned under and caught in the stitch slide fastener is placed on inside of right firstiching shall continue to top end of fastener also placed on inside of right fasterictinue to the bottom end of the slide fastener or the tape may be turned under. The stitching or the tape may be turned under. The first row shall the top of opened chain positioned as indice pattern and stitch through tape to front of tawith two rows of stitching. The first row and the row 1/8 to 3/16 inch from the first row. The of tape may be turned under. The top stop shallinish 1-3/8 ± 1/8 inches from top edge of film waist. The stitching shall continue to the bott waist. The stitching shall continue to the bott mastern waist. Turn in top edge of outer shell one inch as an extern the continue to the bott mattern with the list maist.	ining material) ich, stitch 1/16 the stitching contag. The top endstaught in the wais The finished was
NO. 44. 44. 45.	

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	TABLE I. (cont'd)	—	SEAM AND	STITCHES		THREAD	
NO.	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	STITCHING	INCH	NEEDLE	ECEBILN/ LOOPER	COVER
46.	Finish leq bottoms.						
	a. Make two horizontal buttonholes or sewn eyelets	401 or		19-24 per	20	50 or	
		502 or		26-32 per	70	50 or	
	or	503		eyelet 26-32 per eyelet	70	50 or	
	b. Secure two grommets in same positions in lieu of buttonholes.						
	c. Position the leg bottom drawcords on inside of leg with end exiting through buttonholes, eyelets or grommets, knot ends of drawcord.						
	d. Turn up bottom of outer shell in accordance with pattern (even with lining material) and with raw edge and slide fastener cover turned in 1/4 inch, stitch 1/8 to 3/16 inch from turned edge, around entire hem and gusset sewing across slide fastener cover.	301	SSI-1	10-14	20	20	
	NOTE: When the hem is stitched, no stitching will interfere with the functioning of the slide fastener or the drawcord.						
	e. Center drawcord in leg bottom hæm. Place a verti- cal bartack through inseam catching leg drawcord.	Bartack		28 per bartack	20	20	
47.	Make and attach adjustment straps.						·
	a. Thread front hip adjustment strap over first bar (opposite pull tab of buckle) and fold strap in half lengthwise so that bar is located at the fold. Fold	301		8-10	20	20	

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
8	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
47.	. Make and attach adjustment straps. (cont'd)						
	under two raw ends of strap 1/4 ± 1/16 inch. Position strap with long edge parallel to waist and with turned under edges 1-1/4 ± 1/16 inches from outseam on the front, and 3/4 ± 1/8 inch below finished waist edge. Stitch to trousers with a 3/8 to 1/2 inch box-x stitch pattern, 1/16 to 1/8 inch from turned under edges.						
	or		 				
	b. Make two bartacks across the width of the strap, the first being 1/16 to 1/8 inch from the turned under edge and the second 1/8 to 1/4 inch away from the first bartack.	Bartack		28 per bartack	20	20	
	c. Turn back one end of back hip adjustment strap 1 ± 1/8 inch and then turn under raw end 1/4 ± 1/16 inch and boxstitch 1/16 to 1/8 inch from edge.	301		8-10	20	20	
	or						
	d. Bartack 1/8 ± 1/16 inch from turned under edge.	Bartack		28 per bartack	20	20	
	e. Thread unfinished end of back hip adjustment strap through pull tab end of buckle by bringing the strap up from underneath the buckle through the pull tab and the first bar, over the first bar and down through the buckle again. Pull unfinished end of strap toward trouser back until turned under end is at the pull tab.						

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	STITCHING	PER	REEDLE	BOBBIN/ LOOPER	COVER
47.	Make and attach adjustment straps. (cont'd)						
	f. Turn under unfinished end of back hip adjustment strap 1/2 ± 1/8 inch. With strap fully extended laying flat, and 3/4 ± 1/8 inch below finished waist edge. Stitch to trousers with a 3/8 to 1/2 inch box-x stitch pattern, 1/16 to 1/8 inch from turned edges.	301		8-10	20	50	
	or						
	g. Make two bartacks across the width of the strap, the first being 1/16 to 1/8 inch from the turned under edge and the second 1/8 to 1/4 inch away from the first bartack.	Bartack		28 per bartack	50	50	
48.	Attach belt loops.						
· · · · · · · · · · · · · · · · · · ·	a. Except for sizes XXX-Small and XX-Small, all other sizes shall have seven belt loops. Sizes XXX-Small and XX-Small shall have five belt loops. All belt loops shall finish 1-5/8 ± 1/8 inches in length (measurement taken between bartacks) on each pair of trousers positioned as follows:						
	(1) Except for sizes XXX-Small and XX-Small, all other sizes shall have one belt loop on each front with the front edges of loops 2-5/8 ± 1/8 inches from respective finished edges of front opening.						
	(2) Except for sizes XXX-Small and XX-Small, all other sizes shall have one belt loop on each front 1/4 to 3/8 inch in front of the adjustment strap turn-under.						-
-1							

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	TABLE I. (cont'd)	STITCH	SEAM AND STITCHING	STITCHES PER		THREAD BOBBIN/	
Σ	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	TYPE	INCH	NEEDLE	LOOPER	COVER
Attach belt loops.	: <u>loops</u> . (cont'd)						
(3) For size centered ± 1/4 finished edges.	(3) For sizes XXX-Small and XX-Small, one belt loop centered ± 1/4 inch on each front from respective finished edges.		,				
(4) One	One centered on each back part.						·· ·
(5) On	(5) One adjacent to seat seam.			-			
b. Turn even with trousers	b. Turn under raw edge of belt loop and position even with the top edge of waist. Bartack to trousers 1/8 to 3/16 inch from top of folded edge.	Bartack		28 per bartack	50	20	-
	or						
c. Posit edge of 1 1/8 to 3/ over and	c. Position raw edge of belt loop 1/4 inch from top edge of finished waist. Bartack to trousers 1/8 to 3/16 inch from edge of waist. Fold loop over and then proceed as specified in d.	Bartack		28 per bartack	20	20	
d. Turn and barta	d. Turn under bottom raw edge to finished position and bartack 1/8 to 3/16 inch from folded edge.	Bartack		28 per bartack	20	20	
Attach th	Attach the fly protective flap.						
a. Posit as indicate the outsi to 1/4 in fly prote	a. Position protective flap on inside of left front, as indicated on pattern, with the outer shell toward the outside and join to trousers and stitch 3/16 to 1/4 inch from back and bottom edge of flap. The fly protective flap may be bartacked at crotch.	301 or Bartack	LSbj-1	10-14 28 per bartack	50 00 00	50	
			- · · · · · · · · · · · · · · · · · · ·				

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
Ñ.	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	TYPE	INCH	NEED! E	EOBBIN/ LOOPER	COVER
49.	Attach the fly protective flap. (cont'd)						
	b. Place a vertical bartack at top back edge of flap through trousers. The bartack shall be positioned 1/4 to 5/16 inch from top and back edges of flap.	Bartack		28 per bartack	20	20	
	or						
	c. As an alternate the bartack may be placed even with the top edge of fly protective flap and 1/4 to 5/16 inch from the back of the flap.		,				
50.	Attach suspender loops.						
	a. Cut suspender loops 6 ± 1/4 inches long.						
	b. Position a loop on each front with the back end of loop $3/8 \pm 1/8$ inch in front of each side seam. The other end of the loop shall extend $4-1/4 \pm 1/4$ inches toward the front of the trousers. Both ends of each loop shall be attached $1/4 \pm 1/16$ inch below the top of finished edge of waist as follows:						
	(1) Turn under end $1/2 \pm 1/16$ inch.						
	(2) Set end at 45 ± 10 degree angle.						
	(3) Bartack 1/8 to 3/16 inch from turned under end across width of the loop.	Bartack		28 per bartack	50	20	
	c. Finished appearance shall be as shown in figure 2.						-

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	TABLE I. (cont'd)		SEAM AND	STITCHES		THREAD	
X	MANUFACTURING OPERATIONS REQUIREMENTS	TYPE	STITCHING	PER	NEEDLE	BOBBIN/ LOOPER	COVER
Attach sna	Attach snap fasteners.						
a. Secure front at v 2A stud-ey waist oper opening) a	a. Secure a double stud snap fastener to right front at waist, or as an alternate secure style 2 or 2A stud-eyelet combination (on right outside of waist opening) and socket (on right side of waist opening) as indicated on pattern.						
b. Secur front at at at at real	b. Secure a female portion of snap fastener to left front at waist, positioned to correspond with male at right front at waist.	\ -					
c. Secur alternate to fly pr with the The fly p	c. Secure a socket or as an alternate a stud (if alternate in 51.a. is used) portion of snap fastener to fly protective flap, positioned to correspond with the double stud fastener on the right front. The fly protective flap shall lay smooth and flat when the socket and stud are engaged.						
d. Secur each carg	d. Secure two female portions of snap fasteners to each cargo pocket flap, as indicated on pattern.						
e. Secure two meach cargo pock on pocket flap.	e. Secure two male portions of snap fasteners to each cargo pocket to correspond to female portions on pocket flap.						
f. Secur trouser b coat back	f. Secure three male portions of snap fasteners to trouser back to correspond to female portions on coat back position as follows:						
(1) er 2-1/4 sizes med	(1) Position the male portion of the snap fastener $2-1/4 \pm 1/8$ inches from finished waist edge for sizes medium, large, X-large and XX-large.						

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								MIL-S-43926J	
	COVER								,
THREAD	BOBBIN/ LOOPER	,							
	NEEDLE								
STITCHES	PER								
SEAM AND	STITCHING								
	STITCH			ć					
TABLE I. (cont'd)	MANUFACTURING OPERATIONS REQUIREMENTS	Attach snap fasteners. (cont'd)	(2) Position the male portion of the snap fastener 1-3/4 ± 1/8 inches from the finished waist edge for sizes XXX-small, XX-small, X-small and small.	Clean coat and trousers.	a. Trim end of threads to 1/4 inch maximum length.	b. Remove all loose threads.	c. Remove all size markings.		
	ġ.	51.		52.					

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3.9 <u>Finished measurements</u>. The finished measurements for coat and trousers shall be as shown in table II.

TABLE II. Finished measurements (inches)

	α	AT	TROL	ISERS
	1/2 Chest <u>1</u> /	Back Length 2/	1/2 Waist <u>3</u> /	Inseam 4/
XXX-Small	17	28	13	32
XX-Small	19	28-1/2	15	32
X-Small	21	29	17	32
Small	23	29-1/2	19	34
Medium	25	30	21	34
Large	27	30-1/2	23	36
X-Large	29	31	25	36
XX-Large	31	31-1/2	27	36
Tolerance	<u>+</u> 3/4	<u>+</u> 3/4	<u>+</u> 3/4	<u>+</u> 1/2

^{1/} Measure across chest from folded side edge to folded side edge at base of armholes.

^{2/} Measure down center of back from collar joining seam to bottom edge of coat.

^{3/} Measure across waist from side edge to side edge with snap fastener at waist secured and fly closed.

^{4/} Measure from crotch seam along inseam to bottom edge of leg.

^{3.10 &}lt;u>Carbon tetrachloride absorption</u>. When tested in accordance with 4.4.5, the carbon tetrachloride absorption of the laminate material in the end item shall show no individual sample result less than 1.3 mg/cm².

^{3.11 &}lt;u>Workmanship</u>. The finished suit shall conform to the quality of product established by this specification and the occurrence of defects shall not exceed the applicable acceptable quality levels. Utmost care shall be taken during component and subassembly fabrication to ensure quality workmanship and safety of the service person using the item.

4. QUALITY ASSURANCE PROVISIONS

- 4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.
- 4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.
- 4.1.2 Responsibility for dimensional requirements. Unless otherwise specified in the contract or purchase order, the contractor is responsible for ensuring that all specified dimensions have been met. When dimensions cannot be examined on the end item, inspection shall be made at any point, or at all points in the manufacturing process necessary to assure compliance with all dimensional requirements.
- 4.1.3 <u>Certificate of compliance</u>. When certificates of compliance are submitted, the Government reserves the right to inspect such items to determine the validity of the certification.
- 4.2 <u>Classification of inspection</u>. The inspection requirements specified herein are classified as follows:
 - a. First article inspection (see 4.3).
 - b. Quality conformance inspection (see 4.4).
- 4.3 <u>First article inspection</u>. When a first article is required (see 6.2), it shall be examined for the defects specified in 4.4.3 and 4.4.4, and tested as required in table IV.
- 4.4 Quality conformance inspection. Unless otherwise specified, sampling for inspection shall be performed in accordance with MIL-STD-105.

- 4.4.1. Component and material inspection. In accordance with 4.1, components and materials shall be inspected in accordance with all the requirements of referenced documents unless otherwise excluded, amended, modified, or qualified in this specification or applicable purchase document.
- 4.4.1.1 <u>Toxicological agents resistance testing</u>. Testing for conformance to initial toxicological agents resistance, shall be in accordance with section 4 of MIL-C-12189, except that after 25 consecutively produced rolls have successfully met the requirements, one out of every two rolls shall be randomly sampled and tested. In the event of a failure under the reduced sampling, 100 percent sampling shall be reinstated until an additional 25 consecutive rolls have successfully met the requirements.
- 4.4.2 <u>In-process inspection</u>. In-process inspection shall be performed on the cloth and foam sides of laminated lining material during the cutting operations and fabrication of the lining. Any cut, tear, needle chew, hole, burn (not repaired in accordance with 3.6.5), or mend (not repaired in accordance with 3.6.5), shall be cause for rejection of the lining. The Government reserves the right to exclude from consideration for acceptance any material for which in-process inspection has indicated nonconformance (see 6.5.2).
- 4.4.2.1 <u>Critical defect examination of end items</u>. Prior to performing the end item sampling examination required in 4.4.3, the coats and trousers shall be 100 percent examined for the critical defects in table III. This 100 percent critical defect examination shall become a part of the contractor's inspection system or quality program.
- 4.4.2.2 <u>Desiccant exposure to atmosphere</u>. The contractor's procedure for ensuring that desiccant units are not exposed to the atmosphere exceeding 2 hours (see 5.1.1) from time of unsealing component packaging to sealing in unit packs shall be described in his/her quality control or inspection plan.
- 4.4.3 End item visual examination. The end items shall be examined for the defects listed in table III. The lot size shall be expressed in units of suits. The sample unit shall be one suit. The inspection level shall be II and the acceptable quality level (AQL), expressed in terms of defects per hundred units, shall be 2.5 for major defects and 10.0 for total (major and minor combined) defects. The AQLs shall be applied separately to the coats and trousers and failure of either the coats or trousers shall be cause for rejection of the lot. The finding of one or more critical defects shall be cause for rejection of the lot.

TABLE III. End item visual defects

			ssificat	
Examine	Defect	Critical	Major	Minor
	COAT AND TROUSERS			
Material defects	Applicable to laminated			
and damages	cloth, foam side:			•
,	 a. Any cut, tear, needle chew, hole, or burn 			
	thru the laminated			
	cloth:			
	- 1/16 to 1 inch long		101	
	inclusive	1	101	
	- more than 1 inch long	1		
	b. Any cut, tear, hole, or burn in knit base fabr.	ic.		
	- 1/2 to 1 inch long	ic.		
	inclusive			201
	- more than 1 inch long		102	
,	c. Any mend:			
	- more than 1-1/4 inches	5		
	in longest direction		103	
	- more than two mends			
	per garment		104	
	Applicable to cotton/nylon			
	outer shell cloth:			
	 a. Any hole, needle chew, 			
	cut, tear, or burn		105	
	b. Mends:			
	- any mend up to 1/4 inc			
	in diameter or length			202
	- any mend more than 1/4	•		
	inch in diameter		100	
	or length - more than two mends		106 107	
•	c. Any defect such as a small	ach	107	
	or multiple float	1011,		203
	d. Any misweave, area of po	or		203
	dye penetration dye str			
	broken or missing yarn,			
	thin place, or shade be			204
	Applicable to butyl cloth:	•		
	- Any hole, cut, tear, mend			
	or needle holes in atropir	ne e		
	pocket	2		

			ssificat	ion
Examine	Defect	Critical	Major	<u>Minor</u>
	COAT AND TROUSERS (cont'd)			
Material defects	- Any hole, cut, tear, mend			
and damages	or needle holes in top			
(cont'd)	sleeve elbow patch, under-			
	sleeve elbow patch, and		100	
	knee patch		108	
	 Any hole, cut, tear, mend or needle holes in chest 			
	pocket protective piece, and hip pocket protective	•		
	piece:			
	- up to and including			
	1-1/4 inch			205
	- over 1-1/4 inch		109	203
	- Heavily coated side not	12	103	
•	facing outward			206
				200
	Applicable to hook and loop			
	fastener tape:			
	- any cut, hole, or tear		110	
	- any missing yarn		111	
·	- any broken yarn			207
	 hook or loop flattened 		112	
	 width not as specified 			208
	- any spot, stain, or streak			209
	- color not as specified			210
Shaded parts	Any outside part shaded except	;		
	those cut from ends			211
Cleanness	Coot or stain (money oil			
Clearness	<pre>Spot or stain (grease, oil, ink)</pre>			212
	IIIK)			212
NOTE	Stains attributed to charcoal			
	content of lining should not			·
	be scored.		•	
	Five or more thread ends			
	in excess of 1/2 inch, not	•		
	trimmed from coat	•		213
	Two or more shade or size			
	tickets or loose threads			
	not removed from coat			214

		Classification		
<u>Examine</u>	Defect	Critical	Major	Minor
	COAT AND TROUSERS (cont'd)			
Cleanness (cont'd)	Five or more thread ends in excess of 1/2 inch, not			
	trimmed from trousers Two or more shade or size tickets or loose threads			215
	not removed from trousers			216
Components and assembly	Any component part or require operation omitted, unless	ed		
	otherwise specified Any assembly or operation not properly performed, unless	:	113	
	otherwise classified herein Any component not as specifie The size of the coat not mate		114	217
•	ing the size of the trousers		115	
Cutting	Any component part not cut in accordance with directional lines indicated on pattern o not in accordance with speci	r		
	fied requirements		116	
Seams and stitching	Accuracy of seaming: a. Seams twisted, puckered, or pleated (unless otherwise classified herein)	r-		218
	 Part of garment caught is unrelated operation or stitching 	n	117	
	c. Ends of seams or stitching produced with 301 stitch type, when not caught in other seams or stitchings, backtacked less than 1/4			,
	or more than 1/2 inch d. Stitching overlapping end(s) of thread breaks less than 1/2			219
	or more than 3/4 inch			220

			ssificat	
Examine	Defect	Critical	Major	Minor
	COAT AND TROUSERS (cont	.'d)		
Seams and stitching (cont'd)	e. Various shades of th used on outside of coat or trousers			221
	f. Ends of a continuous line of stitching n overlapped, or over less than 1/2 or mo	ot lapped		221
	than 3/4 inch			222
	Gage/margin of stitching: a. Gage of double needle stitching more or	е		
	less than specified b. Margin of edge or rai stitching more or less than specified: - up to a length of 2 inches inclusive	:	118	223
	- beyond 2 inches in		110	223
	length		119	
	Open seam:			
	a. Any on joining seam of laminate cloth except those listed in c. but on a length of linch inclusive - over 1/4 but not great than 7/8 inch inclusive	ot pelow: 1/4 reat- n	120	224
	 more than 7/8 inch length Any seam except joini seam of laminate clo and those listed in below: 	.ng nth		
	up to a length of l inch inclusivemore than 1/2 inch		101	225
	length		121	

Towns of	Dofort	Classification		
Examine	Defect	Critical	Major	Minor
	COAT AND TROUSERS (cont'd)	•		
Seams and stitching (cont'd)	c. Any on coat bottom hem, outside collar, trouser waistband turnunder, trouser leg bottom hem, sleeve hem, pocket stitchings, slide fastener tape, or on fastener tape: - 1/4 to 1 inch in length inclusive - more than 1 inch	n.	122	226
NOTE:	One or more broken stitches or two or more continuous skipped or runoff stitches on joining seam constitute an open seam. On double-stitched seams, a seam is considered open when one or both sides of the seam is open.			
	Raw edges (outer shell): a. On outside: - up to a length of 1/2 inch inclusive - more than 1/2 inch in length b. On inside: - any raw edge more than 1/2 inch in length (where edge is require to be turned in)	d	123	227
NOTE:	Raw edges not securely caught in stitching shall be classific as an open seam.	ed		
	Runoffs: a. Joining seams: When resulting in an open seam, use "open seam" classification.			

	Do Forth		ssificat	
Examine	Defect	Critical	Major	Minor
	COAT AND TROUSERS (cont'd)			
Seams and	b. Edge or raisesd stitchin	ig		
stitching (cont'd)	(when not resulting in any open seam):			
	- 1/2 to 1 inch in lengt inclusive	h		229
	- more than 1 inch		124	223
	Seam and stitch type:			
	a. Wrong seam or stitch typb. Looper thread of 401	e		230
	stitch type finishing on outside of coat or			
	trousers		125	
	Stitch tension:			
	 a. Loose tension, up to 1 inch (excluding laminate lining cloth) 	e		231
	b. Loose tension, more than 1 inch (excluding lami- nate lining cloth)		126	231
	c. Loose tension, up to 1 inch on laminate lining			
	cloth d. Loose tension, more than l inch on laminate lining cloth	4	127	
	e. Loose tension on edge of raised stitching			232
	 f. Tight tension (stitches break when normal strain 			232
	is applied to the seam of stitching)	or	128	
NOTE:	Puckering is evidence of tight tension. When puckering is evident, seam shall be tested by exerting pull in lengthwise direction of seam or stitching	•		

Francisco	Defeat	Classification			
Examine	Defect	Critical	<u>Major</u>	<u>Minor</u>	
	COAT AND TROUSERS (cont'd)				
Seams and	Stitches per inch (to be	•			
stitching (cont'd)	scored only when the condi-				
	tion exists on major portion of seam)				
	a. Less than specified:				
	- one or two stitches			233	
	- more than two stitches		129	233	
	b. One or more stitches more				
	than specified			234	
	Stitches skipped or broken in				
	any location other than spec-				
	ified in defect c page 58: - up to a length of 1/2 inch				
	inclusive			235	
	- over 1/2 inch but not greate	r		233	
	than 1 inch in length		130		
	- more than 1 inch in length	5			
Buttonholes	Not as specified			236	
or eyelets	Not in specified position			237	
Grommets	Not as specified			238	
	Not type, class, or size				
	specified			239	
	Omitted, damaged, or malformed			240	
	Improperly clinched		131		
Slide fastener	Shade of tape not as specified			241	
	Any part of slide fastener				
	assembly omitted, bent,				
	broken, cracked, or other-				
	wise defective, affecting function	6			
	Bottom closed-end stop not	O			
	attached as specified		132		
·	Not specified type or size		133		
	Fastener tape cut or torn		134		
NOTE:	The slide fasteners shall be				
	fully closed and opened to				
	determine if the slide fasten-				
	ers are operable and provide				
	a secure closure.				

			-	ssificat	
Examine		Defect	Critical	Major	Minor
		COAT AND TROUSERS (cont'd)			
Snap fastener		Any omitted, mismated, bent,			
		or broken (except on cargo pockets)		135	
		Any fastener not functioning		200	
		properly i.e. fails to snap closed, provide a secure			
		closure, or open freely			
		(except on cargo pockets)		136	
	NOTE:	**	l ·		
		and unsnapped twice to deter-			
		mine whether parts of fastener	•		
		separate freely and also effect a secure closure.			
•		effect a secure closure.			
		Clinched excessively tight,			
		cutting adjacent material		137	
		Clinched loosely, permitting		•	
		any component to rotate			
		freely but not to the degree that any component can be			
		expected to become detached			•
		during use			242
		Clinched loosely to the degree			
		that components can be			
		expected to become detached			
		during use		138	
	NOTE:	Incomplete roll of end of butte	on		
		or eyelet barrel is evidence of			
		improper and insecure clinching	g.		
		Incorrect style		139	
		More than three splits in			
		eyelet or button barrel			243
		Not located on back of coat as specified		•	244
		Not aligned with each other			44 4
		creating bulge or twist			
		when closed			245

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			ssificat:	
Examine	Defect	Critical	<u>Major</u>	Minor
•	COAT			
Elbow patches	Top sleeve elbow patch miss-			
	ing		140	
	Under sleeve elbow patch			
	missing		141	
	Top sleeve or under sleeve elbow patch not stitched as			
	specified to the back side of	f		
	the outer shell material	•	142	
	Out of position by more than			
	1/4 inch			246
Pockets and flaps	Chest and sleeve pocket			
rockets that rraps	protective pieces exposed			
	beyond side or bottom edges			
	of pocket, or exposed beyond		•	
	side or top edges of flap			247
	Chest pocket pull tape missing	J		
	or not properly caught in			
	stitching			248
	Edges of pockets pleated or			040
	twisted in stitching			249
	Raw edges of pocket hems not turned in			250
•	Pocket flap tight causing			230
•	fullness, twisting or			
	curling of pocket flap			251
	Bellows portion of sleeve			
	pocket positioned toward			
	front of pocket		143	
	Sleeve pocket set on crookedly	7		
	or poorly shaped			252
	Sleeve pockets out of align-			
	ment with each other by			252
	more than 1/4 inch			253
	Sleeve pocket not parallel			
	with atropine pocket by 3/8 inch or more			254
	Flap not covering front or			a J7
	back edge of pocket by 3/16			
	inch or more			255

Examine Defect COAT (cont'd) Pockets and flaps (cont'd) Hook and loop portions of fastener tape out of alignment when lying flat: - more than 1/4 inch horizontally - more than 1/4 inch verticall Cut lengths of tape for atropine pocket and flaps less	<u>Critical</u>	Major	Minor
Pockets and flaps (cont'd) Hook and loop portions of fastener tape out of align- ment when lying flat: - more than 1/4 inch horizon- tally - more than 1/4 inch verticall Cut lengths of tape for atro-	у		
(cont'd) fastener tape out of alignment when lying flat: - more than 1/4 inch horizontally - more than 1/4 inch verticall Cut lengths of tape for atro-	У		
(cont'd) fastener tape out of alignment when lying flat: - more than 1/4 inch horizontally - more than 1/4 inch verticall Cut lengths of tape for atro-	y		
- more than 1/4 inch horizon- tally - more than 1/4 inch verticall Cut lengths of tape for atro-	у		
tally - more than 1/4 inch verticall Cut lengths of tape for atro-	у		
- more than 1/4 inch verticall Cut lengths of tape for atro-	Y		256
Cut lengths of tape for atro-	•		257
Diffe bocket and liabs less			
than 1-3/8 or more than 1-5/8			
inches long			258
Cut lengths of tape for			
chest pockets less than			
6-3/8 or more than 6-5/8			
inches long			259
Cut lengths of loop tape for	-		
sleeve adjustments less			
than 4-3/8 or more than			
4-5/8 inches			260
Cut lengths of hook tape for			
sleeve adjustment tab less			
than 3-3/8 or more than			
3-5/8 inches			261
Cut lengths of tape for			
center front overlap less			
than 1-7/8 or more than			
2-1/8 inches in length			262
Cut length of pull tape for			
chest pockets less than			
3-3/4 or more than 4-1/4			
inches			263
Bartack stitching loose,			
incomplete, broken, not			
fully engaging stitched			
material, or not as	•		
specified:			
- involving one bartack			264
- involving two or more			
bartacks		144	
Chest pockets out of parallel			
with respect to finished	•		
center front edge by more			
than 1/4 inch			265

-			ssificat.	
Examine	Defect	Critical	Major	Minor
	COAT (cont'd)			
Pockets and flaps	Chest pockets out of align-			
(cont'd)	ment between corresponding			
•	points by more than 1/2 inch			
	(determination to be made by			
	measuring from bottom of coat)		266
Slide fastener	Top ends of tape not turned in			
	and caught in the stitching			
	joining slide fastener to coa	t		267
	Top stop less than 1/2 inch or			
	more than 5/8 inch from neck			
	edge, or bottom edge of tape			
	more than 1/4 inch from bottom	m		
	of coat or extending beyond		•	
	bottom edge			268
	Back edge of slide fastener			
•	tape less than 1-3/4 or			
	more than 2 inches from			
*	right front edge			269
	Back edge of slide fastener			207
	tape less than 2-3/8 or			
	more than 2-5/8 inches from			
	front left coat front edge			270
Collar	Edges of collar ends out of			
	alignment by more than 1/4			
	inch (place shoulder seams			
	together and extend collar			
	ends to determine alignment)			271
Sleeves	Top sleeve not lapping under			
	sleeve			272
	Ends of underarm seam and side			
	seam staggered more than 1/2			
•	inch (measured from center to			
	center) of double rows of			
	stitching			273
	Sleeve hem less than 1 inch			
	or more than 1-1/4 inches in			
	width			274
•	Sleeve tab set on crookedly or			
	poorly shaped			275
	_			

_	·		ssificat	
Examine	Defect	Critical	Major	Minor
	COAT (cont'd)			
Sleeves (cont'd)	Sleeve tab and loop tape out of alignment (measured at point of attachment to finished hem bottom in parallel direction): - more than 3/8 and less than 3/4 inch		145	276
	Sleeve tab and loop tape not able to be fastened Width of sleeve tab less than 1 inch and more than 1-3/16	7	145	
	inch			277
Shoulder and armhole seams	Fronts and back not lapping sleeves at armhole		•	278
of outer shell	Fronts not lapping back at shoulder		,	279
Coat lining	Knit side of laminate material not finishing toward the inside Seam allowance of joining seams not finishing toward the outer shell	8	146	
Bottom hem	Inside edge of eyelet end of buttonhole less than 4 or more than 4-1/2 inches from finished			
	edge of respective front			280
	Elastic drawcord caught in the stitching Hem less than 1-1/8 or more			281
	than 1-3/8 inches in width			282
Labels	Labels not positioned and attached to the knit side of right front lining as			
	specified			283

	·		ssificat	'
Examine	Defect	Critical	Major	Minor
	COAT (cont'd)			
Labels (cont'd)	Size, instruction, identification, or combination label (when applicable) missing, incorrect, or illegible Surveillance marking omitted, incorrect or illegible Label not stitched on all four sides Stitched through printed	e	147	284 285
	portion of label			286
	TROUSERS			
Leg slide fastener cover	Leg slide fastener covers stitched through lining material Edges of leg slide fastener covers not abutted or over-		148	
	lapping 1/16 inch or more when fastener is closed Ends of zipper tape not caught in the line of stitching at top of leg			287
	opening With slide fastener in closed position, slider at top of opening	9		288
	Thong omitted on trousers slide fastener pull Slide fastener top stop (at trouser hem) located more than 1-1/4 inches			289
	from finished hem			290
Suspender loops	End of loop not turned under or not attached to inside of trouser on waist hem End of loop not below			291
	finished edge of waist 3/16 to 5/16 inch			292

			ssificat	ion
Examine	Defect	Critical	Major	Mino
	TROUSERS (cont'd)			
Suspender loops	Back end of loops not lo-			
(cont'd)	cated 1/4 to 1/2 inch in			
	front of side seams			293
	Loop finishing less than 4			
	or more than 4-1/2 inches			
	in length between center of bartacks			294
	Bartack not at angle specified			295
	Loop less than 3/8 or more			293
	than 1/2 inch in width			296
	Bartack stitching loose,			230
	incomplete, broken, not fully	,		
	engaging stitched material,			
	or not as specified:			
	 involving one bartack 			297
	- involving two or more			
	bartacks		149	
	Suspender loop missing		150	
Belt loops	Less than 3/8 or more than 1/2			
-	inch wide			298
	Less than 1-1/2 or more than			
	1-3/4 inches in length			
	between bartacks		,	299
	Front edges of belt loops on			
•	fronts less than 2-1/2 or			
	more than 2-3/4 inches from		•	
	respective finished edges			
	of front opening (not			
	applicable to sizes XX-Small and XXX-Small)			201a
	One or both side loops not			201a
	on front or more than 1-1/4			
	inches from outseam			202a
	Back loops more than 1/2			2020
	inch off center between			
	outseam and seat seam			203a
	Center back loop not posi-			-004
	tioned adjacent to			
	seat seam			204a
	Set with the covering			
	stitching on the outside			205a

			ssificat:	
Examine	Defect	Critical	Major	Minor
	TROUSERS (cont'd)			
Belt loops (cont'd)	Top folded edge extending	,		
	above or below top edge			
	of waist more than 1/8 inch			206a
	Bartack stitch loose, incom-			
	plete, broken, not fully			
	engaging stitched material,			
	or not as specified:			207-
	- involving one bartack			207a
	- involving two or more		151	
	bartacks		131	200-
	One missing		152	208a
	Two or more missing XX-Small and XXX-Small belt		152	
	loops not centered on front			209a
Hip pockets	Hip pocket protective piece			
and flaps	exposed beyond side or			
	bottom edges of pocket,			
	or exposed beyond side			210-
	or top edges of flap		•	210a
	Hook and loop portions of			
	fasteners out of alignment			
	when flap is lying flat: - more than 1/4 inch horizon-			
	tally			211a
	- more than 1/8 inch verticall	17		211a
	Cut lengths of tape less	<i>3</i>		LILU
	than 7/8 or more than			
	1-1/8 inches			213a
	Pockets and pocket flaps out			
	of alignment with each			
	other by more than 1/4 inch			214a
	Pockets and pocket flaps out			
	of alignment at any corres-			
	ponding point, by more than			
	1/2 inch when measured from			
	top edge of finished waist			215a

			ssificat	
Examine	Defect	Critical	Major	Minor
	TROUSERS (cont'd)			
Cargo pockets	Pleats turned toward front			216a
and flaps	Bellows side finished on from	t		217a
-	Corner of flap caught in			
	bartacks at end of bellows	•		
	opening, restricting free-			
	dom of flap			218a
	Pocket flap not uniform in			•
	shape and size by more			
	than 1/4 inch			219a
	Pocket flap not completely			
	covering pocket opening			
	by 3/16 inch or more			220a
	Snaps omitted or improperly			
	placed			221a
	Raw edge of pocket hems not			
	turned in			222a
	Pocket flap tight causing			
	fullness, twisting, or			
	curling of pocket flap			223a
	Edge of pockets pleated or			
	twisted in stitching	_		224a
	Pocket and pocket flaps out of	Ē		
	alignment with each other by			
	more than 1/4 inch			225a
	Cargo pocket protective piece	_		
	exposed beyond side or bottom	n.		
	edges of pocket, or exposed			
	beyond side or top edges of			226a
	flap Top of pockets or pocket			220d
	flaps out of alignment, at			
	any corresponding point by more than 1/2 inch when			
	measured from top edge of			
	finished waist			227a
	IIIISIKA WAISC			a.e.ia
Snap fasteners	Not located as specified			228a
	Not aligned with each other			
	creating excessive bulge			
				229a
	or twist when closed			229

			ssificat	ion
Examine	Defect	Critical	Major	<u>Minor</u>
	TROUSERS (cont'd)			
Fly protective flap	Bartack not as specified Bartack not located as			230a
	specified			231a
Hip adjustment strap and buckle	Improperly threaded, i.e., causing buckle to finish on reverse side or to			
	function improperly Top end of strap positioned		153	٠
	more than 7/8 or less than 5/8 inch from top of finished waist	i		232a
	Turned under edge of front hip adjustment strap less than 1-3/16 or more than 1-5/16 inches forward of the			2020
	outseam Hem on free end of adjustment			233a
	strap less than 5/8 or more than 3/4 inch or not box- stitched or bartacked as			,
	specified Buckle defective or burred,			234a
	affecting function Adjustment straps (when	ı	154	
	loosened) not extending full length on back of trousers, or extending beyond their length, i.e., not permitting	·		
	full expansion of top of trousers			235a
Front opening	Top stop on fastener tape less than 1-1/4 or more			
	than 1-1/2 inches from finished top edge of waist Back edge of slide fastener			236a
	chain extending less than 1/8 or more than 1/4 inch beyond right front edge			
	of opening			237a

•		_	ssificat.	
Examine	Defect	Critical	Major	Minor
	TROUSERS (cont'd)			
Front opening (cont'd)	Top edge of slide fastener tape not turned under			
	when positioned on outside of right front			238a
	Double stud snap fastener not secured to right front			239a
	Thong omitted on trouser slide fastener pull			240a
Knee patches	Knee patch missing	,	155	
•	Knee patch not stitched as specified to the back side			
	of the outer shell material Out of position by more than		156	
	1/4 inch			241a
Drawcords	Dipping or impregnation omitted on any end			242a
	Knot omitted on both ends of one or more cords			243a
	Dipping or impregnation less than 1/2 inch in length			244a
	Any drawcord less than 29 or more than 31 inches			245a
Finished waist	Top hem turned down less than			
•	5/8 or more than 7/8 inch			246a
Outseams, inseams, and crotch seam	Fronts not lapping back Left front not lapping right front		157	247a
	Crotch and seat seam staggered more than 1/4 inch	1		248a
	Opening in crotch area, not covered by protective flap	10		
Leg hems	Eyelet end of buttonhole not toward inseam			249a
	Drawcord caught in hem stitching			250a
	Bartack at inseam missing or not catching drawcord			251a

			ssificat	
Examine	Defect	Critical	Major	Minor
	TROUSERS (cont'd)			
Leg hems (cont'd)	Bottom hem turned up less than 7/8 or more than 1-1/8 inches			2525
	Finished bottom hem less than 5/8 or more than 7/8			252a
	inch			253a
Crotch seam (joining outer shell to lining)	Stitching joining outer shell to lining extending less than 1-1/4 or more than 1-1/2 inches below fly opening, or extending less than 3/4 or more than 1 inch above fly opening			254.5
	than 1 inch above fly opening Stitching joining outer shell to lining extending less than 3/16 or more than 5/16 inches across fly, or not superimposed on inside row of crotch joining seam			254a 255a
Trousers lining	Knit side of laminate material not finishing toward the inside	11		
	Seam allowances of joining seams not finishing toward the outer shell		158	
Labels	Label not positioned and attached to the knit side of left back lining, as			
	specified Size label, instruction label, identification label, or combination label (when appli cable) missing, incorrect,	_		256a
	or illegible Surveillance marking omitted,		150	257a
	<pre>incorrect, or illegible Label not stitched on all four sides</pre>		159	258a
•	Stitched through printed portion of label			259a
	portion or raper			239d

4.4.4 End item examination. The end items shall be examined for the defects listed below. The lot size shall be expressed in units of suits. The sample unit shall be one suit. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

DEFECTS

Any measurement deviating from any dimension specified in table II.

Sleeve lengths uneven by more than 1/2 inch.

Leq lengths uneven by more than 1/2 inch.

Specified number of desiccant units not enclosed.

4.4.5 <u>End item testing</u>. Samples of the suit shall be submitted to the Government for acceptance testing for the characteristic specified in table IV. The lot size shall be expressed in units of suits. The sample unit shall be one suit. Any test failure shall be cause for rejection of the lot. The sample size shall be as follows:

Lot size	Sample size
800 or less	2
801 to 22,000 inclusive	3
22,001 and over	5

TABLE IV. End item testing

Characteristic	Require- ment paragraph	Test method	No. determinations per sample unit	Results reported numerically to nearest
Carbon tetra- chloride adsorption	3.10	<u>1</u> /	4 <u>2</u> /	0.1 mg/cm ²

- 1/ The test procedure shall be as specified in MIL-C-43858, except that the test samples shall be conditioned in an air circulating oven at 50°C for at least 3 hours and that no individual sample determination shall be less than 1.3 mg/cm².
- 2/ A sample of the seamless impregnated material shall be taken from an area adjacent to each of the following areas of the coat and trouser:

Coat

a. At the underarm including sleeve, side and armhole seams.

b. At the top of shoulder including shoulder, armhole and sleeve seams.

Trousers

- a. At the crotch including crotch, seat, and inseams.
- b. At the side seam midway between top of waist and top of protective flap at side opening.
- 4.4.5.1 <u>Carbon tetrachloride warning</u>. Carbon tetrachloride is a suspect carcinogen per OSHA and the American Conference of Governmental Industrial Hygienists Threshold Limit Value (ACGIH-TLV) Booklet (ACGIH, Cincinnati, OH, 1986, page 40). Personnel exposed to carbon tetrachloride should be informed of the potential hazards. Use should be contained in a ventilation hood. Ensure personnel use measures to prevent respiratory, skin, or other exposure by using personnel protective equipment. Consult the Material Safety Data Sheet (MSDS) for handling procedures and appropriate protective equipment.

4.4.6 Packaging examination.

- 4.4.6.1 Seam strength testing. Filled and sealed unit packs shall be tested as specified in ASTM F 88 for conformance to seam strength requirements in 5.1.1.1. Lot size shall be expressed in unit packs. The sample unit shall be one unit pack. The inspection level shall be S-2. Any failure shall result in rejection of the lot.
- 4.4.6.2 <u>In-process unit pack examination</u>. Every filled and sealed unit pack shall be examined for the defects listed below. The finding of any defect shall be cause for rejection of the unit pack. Suits from rejected unit packs may be re-unit packed as specified in 5.1.1.1 and submitted for reexamination.

Defect

Closure seal width not as specified. Closure seal not continuous. Tear, cut, or hole in unit pack.

- 4.4.6.3 Unit pack leakage testing. Every filled and sealed unit pack, prior to overpacking as specified in 5.1.1.2, shall be tested as specified in 4.5.1 for conformance to the leakage requirements in 5.1.1.1. Any unit pack which fails the test in 4.5.1 shall be opened and the suit shall be removed, thoroughly dried, re-unit packed as specified in 5.1.1.1, and retested as above.
- 4.4.6.4 Overpack volume testing. Filled and sealed overpacks shall be tested as specified in 4.5.2 for conformance to the volume requirements in 5.1.1.2. The lot size shall be expressed in overpacks. The sample unit shall be one overpack. The inspection level shall be S-2. Any failure shall result in rejection of the lot.

4.4.6.5 Overpack examination. Every filled and sealed overpack shall be examined for the defects listed below. The finding of any defect shall be cause for rejection of the overpack. Unit packs from rejected overpacks may be re-overpacked as specified in 5.1.1.2 and submitted for reexamination.

Defect

Closure seal width not as specified Closure seal not continuous Tear, cut, or hole in overpack

4.4.6.6 Shipping container examination. The fully packaged end items shall be examined for the defects listed below. The lot size shall be expressed in units of shipping containers. The sample unit shall be one shipping container, fully packaged. The inspection level shall be S-2 and the AQL, expressed in terms of defects per hundred units, shall be 2.5.

Examine	<u>Defect</u>
Marking (exterior and interior)	Omitted; incorrect; illegible; of improper size, location, sequence, or method of application.
Materials	Any component missing, damaged, or not as specified.
Workmanship	Inadequate application of components such as incomplete closure of container flaps, loose strapping, inadequate stapling, or incomplete waterproofing. Bulged or distorted container. Inside dimensions of container not as specified. Partition not as specified.
Content	Number of unit packs per container less than required. Size shown on one or more unit packs not as specified on container. 1/

- 1/ For this defect, one unit pack from each container in the sample shall be examined.
- 4.4.6.7 <u>Palletization examination</u>. The fully packaged and palletized end items shall be examined for the defects listed below. The lot size shall be expressed in units of palletized unit loads. The sample unit shall be one palletized unit load, fully packaged. The inspection level shall be S-1 and the AQL, expressed in terms of defects per hundred units, shall be 6.5.

<u>Examine</u> <u>Defect</u>

Finished dimensions Length, width, or height exceeds specified

maximum requirement.

Palletization Pallet pattern not as specified

Load not bonded as specified.

Weight Exceeds maximum load limits.

Marking Omitted; incorrect; illegible; of improper size,

location, sequence, or method of application.

4.5 Methods of inspection.

- 4.5.1 <u>Leakage test</u>. Each unit pack shall be tested for leaks in accordance with the hot water technique of Method 5009 of FED-STD-101. Bubbles which may appear on the surface of the unit pack but are not released at a slowly decreasing rate are not to be construed as an indication of failure. A steady stream or recurring succession of bubbles from any surface or seam shall be considered a failure. Upon completion of the test, the unit packs shall be thoroughly dried prior to overpacking.
- 4.5.2 Volume test. The total volume of the finished overpacked unit pack shall be determined by a water displacement method. The measuring container shall have a surface area of not more than 300 square inches. The container shall be filled with water to a level that allows total submersion of the overpack. A vertical gauge shall be mounted on the container so that the change in water level can be determined. Each finished overpacked unit pack shall be placed in the water and held under the water so that the top surface of the overbag is 1/8 to 2 inches below the surface of the water. When the water turbulence has subsided to less than 1/8 inch total fluctuation, the vertical gauge shall be read. Calculate the total displacement of water to determine volume (see 5.1.1.2).
- 4.5.3 Loose stitch test prior to daily production. All single stitching for attaching foam knit laminate cloth to itself shall be evaluated to assure that the seams are properly constructed so as to compensate for the foam compression. Visually, the overall seam structure shall be embedded into the face of the foam laminate. Maximum seam clearance shall be confirmed by the following apparatus and procedure:
- a. <u>Apparatus</u>: Hand sewing needle, size 70/2 sewing thread conforming to A-A-50199, 2.0 ounces $(57 \pm 6 \text{ gm})$ weight including hook, fine grit sandpaper, thickness gage 0.1 psi having a 0.001 inch precision capability.
- b. <u>Procedure</u>: Dull the tip of a typical hand sewing needle with fine grit sandpaper and feed three strands of 70/2 sewing thread through the needle's eye. Tie the total six strands into a single over hand knot about

6 inches from the needle's eye and tighten knot by hand until a knot size of 0.036 ± 0.002 inch is achieved at the thickest spot using the specified thickness gage for measurement. From the knit side of the foam/knit lamininate cloth, intersect the sewing needle between two stitches being careful not to catch either the knit laminate cloth or the stitch thread. With the foam side of the foam/knit laminate cloth facing down, place thumbs about 1/2 inch to either side of thread intersection and force the seam allowance foam sides to be flush with the base fabric foam side. Hook the intersecting thread on needle side to the 2 ounce weight and gently lift the foam/knit cloth upwards until the weight is free hanging (see figure 3). Allow weight to hang for 5 seconds. If weight remains hanging after the 5 seconds, then the seam shall be considered to be properly constructed. If the weight pulls the knot through the seam, the seam is too loose and considered a critical defect.

PACKAGING

- 5.1 Preservation. Preservation shall be level A.
- 5.1.1 Level A preservation.
- 5.1.1.1 Unit packing. One suit consisting of a coat and pair of trousers of the same size, cut and assembled from the same lot of impregnated cloth, and six desiccant units conforming to type II of MIL-D-3464 shall be unit packed in a notched, water vaporproof, greaseproof barrier bag conforming to type I, class E, style 1 of MIL-B-117. The suit shall be folded and then rolled together to form a cylindrical shape. During the process of rolling the suit, the six desiccant units shall be placed toward the center of the roll along with all grommets, buckles and slide fasteners. The total time of exposure of the desiccant to the atmosphere after removal from its sealed container until final closure of the barrier bag shall not exceed 2 hours. In order to maintain the cylindrical shape of the suit while packaging, the suit shall be secured with a minimum 2 inch wide, 50 pound basis weight kraft paper strips that are fastened together with pressure sensitive adhesive tape. The outer surfaces of the barrier bag shall be uniformly colored overall with a color in the range of 34079 to 34087, inclusive, of FED-SID-595. The barrier bag shall be flat style, having inside dimensions of 14-1/2 by 23 \pm 1/4 inches for end opening bags and 20 by 17 \pm 1/4 inches for side opening bags. Excess air in the bag shall be removed by physical compression or by use of a partial vacuum (not to exceed 15 inches of mercury). The closure shall be heat sealed. The heat seal shall be 3/16 to 1/2 inch in width, uniform and smooth (without wrinkles or foreign matter) and shall have a seam strength of not less than 7 pounds per inch of width when tested in accordance with 4.4.6.1. The filled and closed unit shall not leak when tested in accordance with 4.4.6.3.

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5.1.1.2 Overpacking. Each suit, unit packed as specified in 5.1.1.1, shall be thoroughly dried after testing in 4.4.6.3 and overpacked in a plastic pouch conforming to size 1 of MIL-P-44406. The corners of the unit packed suit shall be folded onto itself, as necessary and in such a manner as not to puncture either the pouch material or the suit unit pack material and to facilitate the heat seal closing of the pouch. The large opening of the pouch shall than be closed using a continous heat seal. The heat seal shall be 3/16 to 1/2 inch in width, uniform and smooth (without wrinkles or foreign matter) and shall have a seam strength of not less than 7 pounds per inch of width when tested in accordance with ASTM F 88. A vacuum tube shall be inserted into the pouch through the vacuum port. Excess air trapped between the unit pack and the pouch shall be extracted using a vacuum. After removal of the excess air, the vacuum port of the pouch shall be pinched-off as a vacuum tube is being withdrawn and then immediately closed with a heat seal.

TABLE V. Inside dimensions of shipping container

		Container size (inches)		
Suit size	Length	Width	Depth	Tolerance
XXX-small to medium	16	15-1/4	13-1/4	± 3/16
Large to XX-large	17	15-1/2	14-1/2	± 3/16

- 5.3 <u>Palletization</u>. When specified (see 6.2), suits packed as specified in 5.2.2 shall be palletized on a 4-way entry pallet in accordance with load type Ia of MIL-STD-147. Pallet types shall be type I (4-way entry), type IV or type V in accordance with MIL-STD-147. Pallets shall be fabricated from wood groups I, II, III, or IV of MIL-STD-731. Each prepared load shall be bonded with primary and secondary straps in accordance with bonding means C and D or film bonding means F or G. Pallet pattern shall be number 95 in accordance with appendix of MIL-STD-147.
- 5.4 Marking. In addition to any special marking required by the contract or purchase order, unit packs, shipping containers, and palletized unit loads shall be marked in accordance with MIL-STD-129. Inspection/test data as specified in MIL-STD-129 for shelf life markings shall be based on the date of impregnation of the foam material and not the date that the suit is manufactured. (The last six digits of the surveillance number are the day, month, and year of impregnation.) Additionally, unit packs shall be marked as specified in 5.4.1, 5.4.2 and 5.4.3. All unit pack markings, except for the fit and size prediction legend, shall be marked on the same face of the vapor barrier bag. Size and fit legend shall be marked on the reverse face.

5.4.1 <u>Surveillance marking</u>.

- 5.4.1.1 <u>Unit pack</u>. Each unit pack shall be marked with the surveillance marking indicated on the inclosed suit (see 3.3.13.1). The markings shall be printed or stamped below the identification and contract data markings in 1/2 inch high black characters.
- 5.4.1.2 <u>Shipping container</u>. Each shipping container shall be marked with the surveillance marking indicated on the inclosed suit (see 3.3.13.1). The markings shall be stenciled, stamped or printed on the same side of the container as the identification and contract data markings and on one end of the container in 1-inch high black characters.
- 5.4.2 Fit and size prediction legend markings. Each unit pack shall be marked with a fit and size prediction legend as specified in 3.3.13.5. Markings shall be printed in black, bold face characters. The item identification characters shall be a minimum of 18 point (approximately 1/4 inch in height) and the instructive information characters shall be a minimum of 10 point (approximately 1/8 inch in height).

5.4.3 Special marking.

- 5.4.3.1 <u>Unit pack</u>. Each unit pack shall be marked in black with a capital letter "C", for class 1, Woodland Camouflage and a capital letter "D-3" for class 3, Desert Camouflage (3 color). This letter shall be 4 ± 1 inches in height and centered on the face of the vapor barrier bag.
- 5.4.3.2 Shipping container. Each shipping container shall be marked in black on three sides with the characters "4C", for class 1, Woodland Camouflage and "4D-3" for class 3 Desert Camouflage (3 color). These characters shall be 4 ± 1 inches in height and centered on the three sides of the shipping container. The side containing the identification and contract data marking need not be marked.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

- 6.1 <u>Intended use</u>. The suit is intended for use by combat personnel to provide protection against battlefield concentrations of chemical agents in liquid, vapor, or aerosol form.
- 6.2 <u>Acquisition requirements</u>. Acquisition documents must specify the following:
 - a. Title, number and date of this specification.
 - Special provisions for verification inspection of Life Support Clothing and Equipment (see 1.1).
 - c. Class and size (see 1.2).
 - d. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
 - e. When a first article is required (see 3.1, 4.3, and 6.3).
 - f. Level of packing (see 5.2).
 - q. Type and class of unit load required (see 5.2.1).
 - h. When palletization is required (see 5.3).
- 6.3 <u>First article</u>. When a first article is required, it shall be inspected and approved under the appropriate provisions of FAR 52.209-4. The first article should be a preproduction sample. The contracting officer should specify the appropriate type of first article and the number of units to be furnished. The contracting officer should include specific instructions in acquisition documents regarding arrangements for selection, inspection, and approval of the first article.
- 6.4 <u>Sample and shade sample</u>. For access to sample of the end item and samples for shade, address the contracting activity issuing the invitation for bids or request for proposal.

6.5 Warning.

- 6.5.1 <u>Protection of processed goods</u>. Processed goods should be protected from exposure to chemical vapors such as solvents to prevent contamination of the activated carbon.
- 6.5.2 Personnel protection. During the handling of the charcoal containing material used in fabricating the Suit, Chemical Protective, charcoal from the material may collect in various places; for example, on the skin of the personnel, particularly on the hands, and on sewing machines and cutting tables. Therefore, it is essential that the industrial hygiene procedures required by the Occupational Safety and Health Standards be closely adhered to during the manufacturing of the suit. Provide general and local exhaust ventilation sufficient to maintain airborne dust concentration below that listed in OSHA 1910.1000. Otherwise, respiratory protection may be required due to charcoal dust generation. Personnel should wear gloves and protective clothing when handling the material. Chemical safety goggles should be worn whenever eye contact may occur. Personnel should not wear contact lens. Also, washing facilities and eyewash stations should be available in the work areas.
 - 6.6 <u>Subject (key word) listing.</u>

Chemical warfare agent Combat Disposable Expendable clothing Protection

- 6.7 <u>Supersession data</u>. The class 2 desert camouflage pattern (6 color) suit has been deleted as it is no longer required.
- 6.8 <u>Changes from previous issue</u>. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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Army - GL Navy - NU Air Force - 99

Review activities:

Army - MD, EA Air Force - 11, 82 DLA-CT

User activity:

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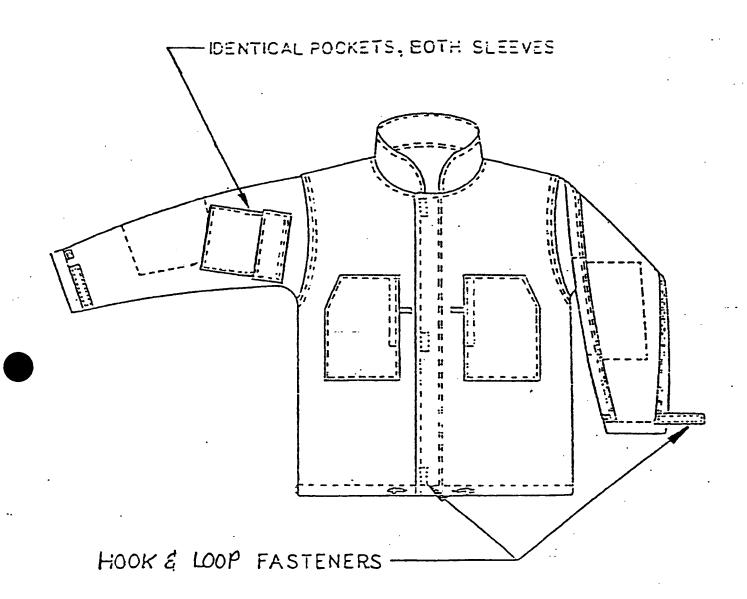
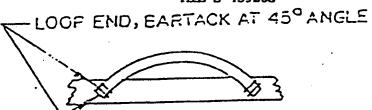


FIG-I- SUIT, CHEMICAL PROTECTIVE (COAT)



SUSPENDER LOOP ATTACHMENT

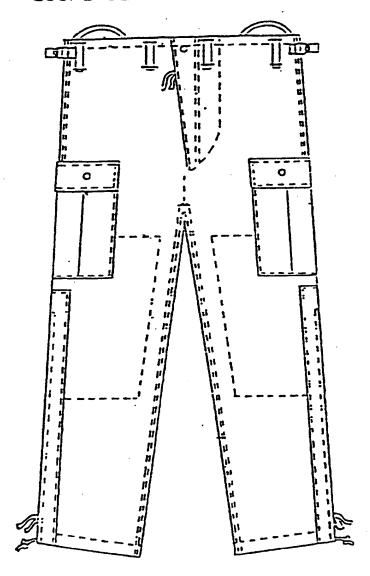


FIG-2- SUIT, CHEMICAL PROTECTIVE (TROUSERS)

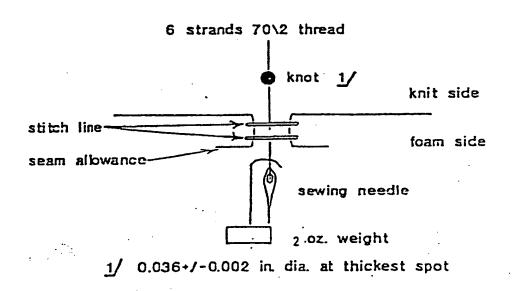


Fig.3 - Loose stitch test

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Sweaters

<u>Vests</u>

Hunting Suits Scent Locking: Hunting Suit Scent Locking - Woodland



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The GI issue chemical protection suit is perfect for hunters. The (carbon) charcoal liner actually absorbs human scent! These suits are very thick, so they are well suited to absorb the sting of paintballs also! Ships with jacket and pants. (Price includes jacket and pants!) These are in woodland camo only and are new in their original package. Please click the link below to view sizing chart and make sure that you get the right size. This chart is VERY accurate.

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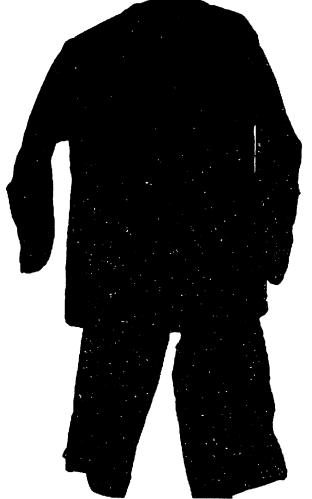
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Genuine G.I. Issue Chemical Protection Suit



GENUINE G.I. ISSUE CHEMICAL PROTECTIVE SUIT.

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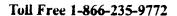




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Suit - Woodland Camo

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These suits were made for the US troops to protect them from Chemical Warfare. The suit Includes both Jacket and Pants. The inner lining is "impregnated" with charcoal which makes it much less messy. Other suits "bleed" the charcoal all over the clothes worn under them. The suit is made large to be worn over clothing. * These suits are excellent for hunting because the charcoal absorbs the human scent.

Available ONLY in size X Large

1 to the years Qty: 1

To see other items in this category, click here!

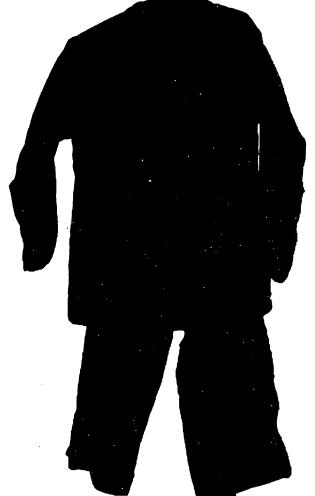
Sleeping Bags Home

Nebo Sleeping Bags

Tents

Bags

Genuine G.I. Issue Chemical Protection Suit



GENUINE G.I. ISSUE CHEMICAL PROTECTIVE SUIT.

Constructed from cotton twill outer shell with black charcoal filter inner lining. Jacket features: elastic cuffs, drawstring bottom, full length brass zipper with snap-over flap, and two velcro closing breast pockets. Pants feature: adjustable waist tabs, suspender and belt loops, side leg zippers with velcro flap, and two velcro closing leg pockets. These suits are oversized so as to fit over normal clothing. Extremely warm, make great hunting outfits.

Surplus

Sizes:

EXTREMELY LIMITED QUANTITIES

1 Extra Small, 1 Medium, 3 Large 1 Extra Large

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Carlos Chemical Protention State CA-SUIT Reputs with 1978-99 Sale price: \$75.97 | Order

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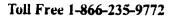
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*Free Shipping

Chemical Protective Suit -Woodland Item#: 17-005

\$49.99



Chemical Protective Suit - Woodland Camo

NEW in BAG

These suits were made for the US troops to protect them from Chemical Warfare. The suit Includes both Jacket and Pants. The inner lining is "impregnated" with charcoal which makes it much less messy. Other suits "bleed" the charcoal all over the clothes worn under them. The suit is made large to be worn over clothing. * These suits are excellent for hunting because the charcoal absorbs the human scent.

Available ONLY in size X Large

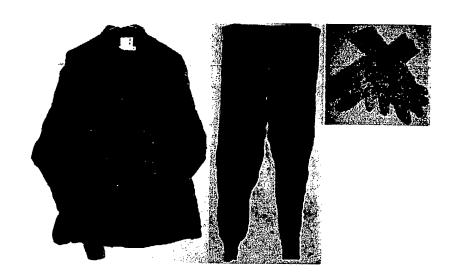
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Sleeping Bags Home

Nebo Sleeping Bags Tents

Sleeping





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Services available

Check item description and payment instructions or contact seller for details.

Will ship to Worldwide.

Seller's payment instructions

Cash or PayPal only please.

Payment methods accepted

This seller, hardmethart, prefers PayPal.



 Other - See Payment Instructions for payment methods accepted Learn about payment methods.

Ready to bid?

LINER, SUIT CHEMICAL PROTECTIVE NBC DATED 1972

Starting bid:

US \$19.99

Your maximum bid: US \$

(Enter US \$19.99 or more)

Place Bid > You will confirm in the next step.

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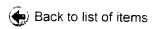
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Listed in category: Collectibles > Militaria > Current Militaria (1991-Now) > Personal, Field

Community

US \$5.99

LG Chemical or MOPP suit Olive Drab Sealed Dated 1981

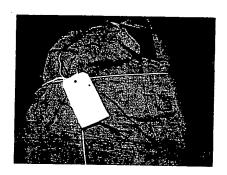
Current bid:

Sell

Item number: 6513479194

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b ;	Place Bid >			
Time left:	2 days 7 hours 7-day listing, Ends Feb-26- 05 18:28:11 PST			
Start time:	Feb-19- 05 18:28:11 PST			
History:	1 bid (US \$5.99 starting bid)			
High bidder:	johnpaul603 (8)			
Item location:	West End, NC United States			
Ships to:	United States, Canada			
Shipping costs:	US \$10.15 - Standard Flat Rate Shipping Service (within United States)			
Shipping, preturn policy	eayment details and			

Seller information

sknppy (683 🏠)

Feedback Score: 683 Positive Feedback: 100%

Member since Feb-14-03 in United States

Read feedback comments Add to Favorite Sellers Ask seller a question

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Description (revised)



eBay User ID sknppy

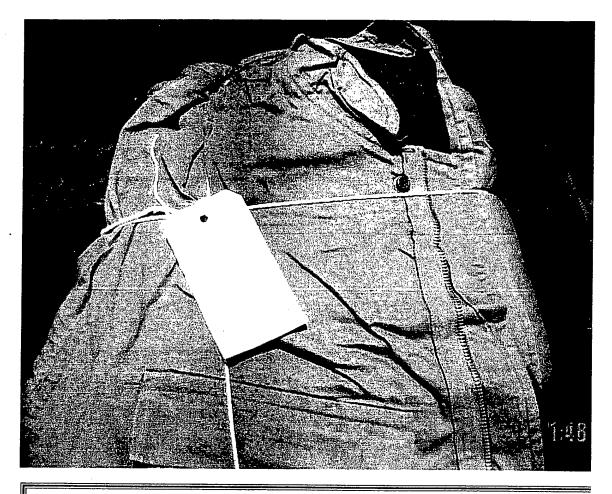
Feb. 23, 2005

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LG Chemical or MOPP suit Olive Drab Sealed Dated 1981



Description:

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1981 Non ... actory Sealer

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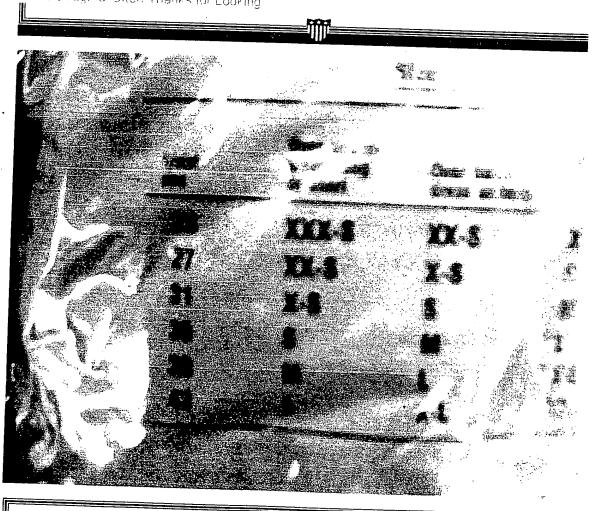
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Condition: New

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fashion. Nonpaying bidders will get negative feedback in 30 days if not paid.



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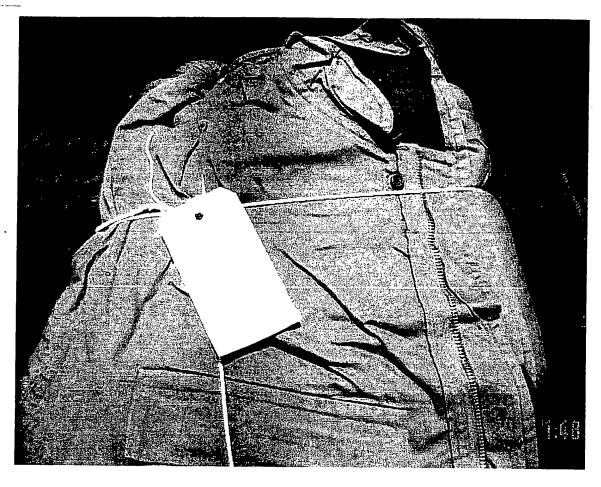
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Payment methods accepted

This seller, sknppy, prefers PayPal.









 Money order/Cashiers check Learn about payment methods.

Ready to bid?

LG Chemical or MOPP suit Olive Drab Sealed Dated 1981

Current bid:

US \$5.99

Your maximum bid: US \$

(Enter US \$6.49 or more)

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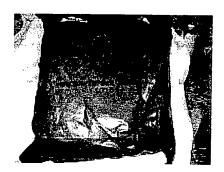
<u>Sporting Goods</u> > <u>Hunting</u> > <u>Apparel</u> > <u>Coats, Jackets</u> > <u>Large</u> Collectibles > Militaria > 1976-89

NIB US MILITARY / HUNTING / ARCHERY CHEMICAL SUIT

Item number: 7137237031

Seller of this item? Sign in for your status

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Starting bid: US \$12.99

Place Bid >

Community

Time left: 5 days 7 hours

7-day listing, Ends Mar-01-

05 18:44:43 PST

05 18:44:43 PST

Feb-22-Start time:

History: 0 bids

Item location:

Walleye Country

United States

Ships to:

Worldwide

Shipping costs: Check item

description and payment instructions or contact seller for

details

Shipping, payment details and return policy

Seller information

rv-scout (906 🏚) me

Feedback Score: 906 Positive Feedback: 100%

Member since Aug-28-00 in United States

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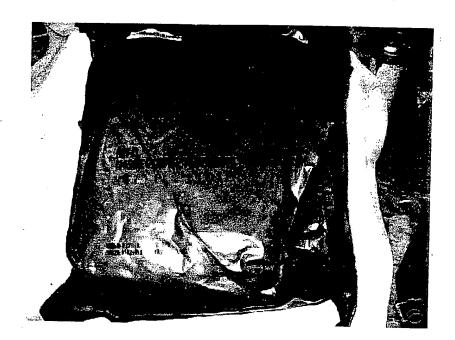
PayPal Buyer Protection NEW!

Free Coverage now up to \$1,000. See eligibility.

Description

Pictured is NEW sealed in original bag, US Military Class 1 MEN'S LARGE Chemical Suit. Suit. follows: 8415-01-137-1705, DLA100-85-C-0402 Lot No. 74. Suit was manufactured 8/89 and an inspe was performed 1/89. The suite is camo and can be worn over outer clothing there are zippers in the pan assist with fitting over boots/shoes. Pants also have 2 large cargo pockets on each side and zipper closu fly. Suit top is separate and also contains a pocket. Size prediction chart is printed on back in summary fit waist 43 over underwear and summer use, waist 39 Over coat and trouser s(hot weather), Waist 35, and trousers man's field, waist 31, over Parka and trousers (men's arctic wear). As can be seen they are generously and could probably be considered an extra large. Lam told that the suits have a charcoal line that over time some of the charcoal may have flaked off and make the suit dirty looking. The suits can cold water, NO detergent to remove the loose charcoal. Great for hunters and a lot less than a sent loc s pay Us shipping which will be quoted based on zip code, NOTE: The suit and packing will weight 10ll interested in a shipping quote please contact me with your zip code. I accept money orders, certified ch

Paypal. Payment to be received within 7 day of the close of the auction. Please feel free to Email me w questions.



Select a picture



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• Other - See Payment Instructions for payment methods accepted Learn about payment methods.

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NIB US MILITARY / HUNTING / ARCHERY CHEMICAL SUIT

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US \$12.99

Your maximum bid: US \$

(Enter US \$12.99 or more)

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eBay item 7137237031 (Ends Mar-01-05 18:44:43 PST) - NIB US MILITARY / HUNTI... Page 3 of 3

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Listed in category: Collectibles > Militaria > Vietnam (1961-75) > Other Vietnam Items

Community

LINER, SUIT CHEMICAL PROTECTIVE NBC DATED 1972

Item number: 6513788390

Seller of this item? Sign in for your status

Buy

Email to a friend | Watch this item in My eBay

Starting bid:

US \$19.99

Place Bid >

Time left:

6 days 17 hours

10-day listing, Ends Mar-03-05 05:21:36 PST

Start time:

Feb-21-

05 05:21:36 PST

History:

0 bids

Item location:

Please view my other auctions

Belgium

Ships to:

Worldwide

Shipping costs: Check item

description and payment instructions or contact seller for

details

Shipping, payment details and return policy

Seller information

hardmethart (570 😭)

Feedback Score: 570 Positive Feedback:

98.0%

Member since Dec-11-

00 in Belgium

Read feedback comments

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Safe Buying Tips

Description (revised)

Larger Picture

Liners for Shirt & Trousers plus NBC glove inserts - all good, no rips etc. Size Medium. Hard to find Buyer to pay shipping costs. Cash \$USD or Paypal - no checks please.

Happy bidding.

Select a picture



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Home > All Categories > Search Results for 'Scent Lock'

All Items	N	<u>Auctions</u>	<u>B</u> ı	uy It Now	Sign in to se	e your c	ustomized	search option
Scent Lock Search title and o	descrip	otion		All Cat	egories		▼ Sea	Advanced
Matching Categories		8 item	s found for Sce	ent Lock			« Ado	to Favorites
Collectibles (5) · Militaria (5) Sporting Goods (3)		List \	/iew Picture (GallerySort by:	Time: ending	soonest	 ;	omize Display
- Hunting (2)		4 -	Compare	Item Title	<u>PayPal</u>	<u>Price</u>	Bids	Time Left -
Archery (1) Search Options Show only:		Γ		5 Hunting Suit Hunters Scent Lock Chemica Large	. കു	\$50.00	-	3h 51m
☐ Items listed with Pa☐ Buy It Now items☐ Gift items☐ Items listed as lots☐	•	r		GAMEHIDE HUNTING JAC SCENT LOCK XXL NR	KET SIZE	\$16.50	7	1d 05h 09m
Completed listings Listings		F		CAMO SCENT LOCK SUIT - N		\$25.00	_	3d 07h 26m
Ending within 1 hour Items priced to Items within 200 miles of	<u> </u>	<u>-</u>	₽Ŝ	Scent Lock suit (Scent Lock, Scentlok,) Size New!! hunting cloth bow, compour bow, Scent Blocker	ing, 20	\$60.00 \$169.00	=Buylt Now	3d 08h 11m
Show Items <u>Customize</u> options displayed above.		Γ.	A	Hunting Suit Hunters Scent Lock Chemical		\$10.00	· •	3d 22h 59m
More on eBay Shop eBay Stores				Hunting Suit Hunters Scent Lock Chemical Small/Medium	@ ©	\$10.00 \$18.00	- =Buylt Now	4d 04h 00m
- Military Griffin(4) - ASA-ARCHERY SUPF See all matching Stores	:) _		New U.S. GI Military Chemic Suit LG Scent		\$18.00 \$25.00	- =Buylt Now	4d 19h 26m



5 Hunting Suit Hunters Scent Lock Chemica Large

₽♥ \$50.00

5d 23h 29m

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Use the checkboxes and click the Compare button to compare items side-by-side.

Page 1 of 1

Some of the matching items found in other eBay areas

17 items - Additional Buy It Now items found exclusively in eBay Stores

· An eBay Store is an eBay seller's online storefront. Learn more.

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	HUNTING Suit ARMY Scent LOCK Charcoal SUIT 4 Deer	\$14.95	=BuyIt Now	ARMY NAVY STORE AND MORE
	Hunting ARMY Surplus - USGI OD SCENT LOCK Hunting SUIT	\$17.95	<i>≅Buylt Now</i>	ARMY NAVY STORE AND MORE
	Hunting Suit Hunters Scent Lock Chemical Small/Medium	\$18.00	=Buy!t Now	Military Griffin
	Hunting Suit Hunters Scent Lock Chemical Small/Medium	\$18.00	=BuyIt Now	Military Griffin
	Hunting Suit Hunters Scent Lock Chemical Small/Medium	\$18.00	=BuyIt Now	Military Griffin
	Hunting Suit Hunters Scent Lock Chemical Small/Medium	\$18.00 [°]	=BuyIt Now	Military Griffin
10	Hunting Suit Hunters Scent Lock Chemical Small/Medium	\$18.00	=BuyIt Now	Military Griffin
	Hunting Suit Hunters Scent Lock Chemical Small/Medium *	\$18.00	∓Buy!t Now	Military Griffin
	archery CAMO Coat MEDIUM Govt Issue NEW! Scent Lock	\$20.00	≅BuyIt Now	waltersr11's The Camo Gallerie
80	archery CAMO Pants 33-39 Waist Govt Issue! Scent Lock	\$20.00	≅BuyIt Now	waltersr11's The Camo Gallerie
	CAMO Pant 30-37 Waist Govt Issue Scent Lock NEW	\$20.00	=Buy It Now	waltersr11's The Camo Gallerie
r É	Military Surplus US ARMY CAMO SCENT LOCK HUNTING SUIT	\$24.95	≅Buy It Now	ARMY NAVY STORE AND MORE
	CAMO SCENT LOCK SUIT - NEW	\$25.00	=BuyIt Now	ASA-ARCHERY SUPPLIES
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Listed in category: <u>Collectibles</u> > <u>Militaria</u> > <u>Surplus</u> > <u>Other Military Surplus</u>

Hunting Suit Hunters Scent Lock Chemical Small/Medium

Item number: 6513902513

Seller of this item? Sign in for your status

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Starting bid: US \$10.00

Place Bid >

FBuylt Now price: US \$18.00

Buy It Now.>

Time left:

4 days 3 hours

7-day listing, Ends Feb-28-05 15:04:00 PST

Start time:

Feb-21-05 15:04:00 PST

History:

0 bids

Item location:

Wilkes-Barre, PA

United States

Ships to:

Worldwide

Shipping costs: Check item description and

payment instructions or

contact seller for details

Shipping, payment details and return policy

Seller information

militarygriffin (11582 な)

Power Seller

Feedback Score: 11582
Positive Feedback:

99.4%

Member since Nov-28-01

in United States

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Storel

estores Military Griffin

PayPal Buyer Protection №

Free Coverage now up to \$1,000. See eligibility.

Description

This is a NEW and sealed British NBC Chemical suit. A must have for use with your GAS MASK. It is in DPM camouflage (British WOODLAND CAMOUFLAGE). It is a Small/Medium. Activated Charcaol lined. Great for hunters, the charcoal blocks Human scent. Works the same way as those expensive "HUNTING SUITS". Pants have vecro flap closure at waist. Side cargo pockets with attached suspenders. Velcro open legs at bottom so you can put them on without taking your boots off. Velcro closure at bottom of pant legs. Jacket has two velcro flap breast pockets & one velcro flap pocket on each arm. With zipper & velcro front closure, velro closure on jacket cuffs. Jacket also has hood. Boots, mask and gloves not included.

SET OF RUBBER CHEMICAL BOOTS AND RUBBER GLOVES INCLUDED WHEN YOU BUY THIS ITEM WITH THE BUY IT NOW

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for many more military items, also Web-Tex, Wyvern, Arktis, MARPAT, Cadpat, MOLLE, Blackhawk, Eagle, German/Danish Flecktam, British DPM and other Military Vests, packs and other field gear. Also a large variety of Paintball markers and Paintball gun accessories.



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Listed in category: Sporting Goods > Hunting > Hunting Accessories > Scents,

Scent Eliminators

Military Surplus US ARMY CAMO SCENT LOCK HUNTING SUIT Item number: 7105194971

Similar hunting suits retail for over \$200 +

Buyer or seller of this item? Sign in for your status

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FBuy!t Now price: US \$24.95

Buy It Now >

Item location:

Chesaning, MI United States

Ships to:

Worldwide

Shipping costs:

Calculate shipping costs

Shipping, payment details and return

policy

Seller information

armynavystore0 (1113 🛊

) Power me

Feedback Score: 1113 Positive Feedback: 99.9%

Member since Sep-15-03 in United States

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Store! **estores** ARMY NAVY STORE

AND MORE

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Description (revised)



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USGI Surplus Clothing New GI Style Clothing Novelty/Collectibles Cold Weather Gear

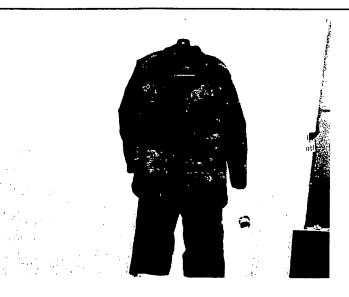
Boot Bunker

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Genuine U.S. Military Camo Chemical Hunting Suit (Scent Lock) contains comfortable cotton fabric with activated charcoal liner that blocks your body odor away from deer or other game. Very effective, super quality 2 piece hunting suit features Velcro cuffs and pockets. Moisture resistant, does a great job blocking your odor. Why spend \$200+ on commercial Scent Blocking Suits when this one does the job? This high quality military

spec suit runs large and is designed to be worn over your clothing. Brand new in sealed packages. Size: 2XSMALL



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click Calculate or select an international

Code:

earn more about how calculated shipping works.

Calculate shipping

Enter your US ZIP

Shipping insurance

Optional

Seller's payment instructions

Payment due within 10 days of confirmed order. We combine orders to save on shipping.

Payment methods accepted

🎾 This seller, armynavystore0, prefers PayPal.



- Personal check
- Money order/Cashiers check
- Other See Payment Instructions for payment methods accepted
- Visa/MasterCard, American Express, Discover

Learn about payment methods.

Ready to buy?

Military Surplus US ARMY CAMO SCENT LOCK HUNTING SUIT

FBuyIt Now price: US \$24.95

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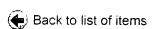
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Listed in category: <u>Collectibles</u> > <u>Militaria</u> > <u>Current Militaria</u> (1991-Now) > <u>Personal, Field</u> <u>Gear</u>

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GI ISSUED MILITARY WOODLAND CAMO CHEMICAL SUIT MEDIUM

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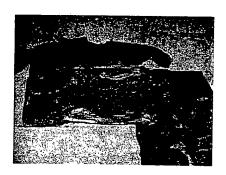
Item number: 6514378700

new in sealed vacuum pack,,\$95.00+MUCH LOWER HERE

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Starting bid: US \$19.95

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Time left: 6 days 11 hours

7-day listing, Ends

Mar-02-

05 22:44:00 PST

Start time: Feb-23-

05 22:44:00 PST

History:

Item location: Summerville,

0 bids

South Carolina

United States

Ships to:

United States

Shipping costs: US \$9.95 -

Standard Flat Rate Shipping Service (within

United States)

Shipping, payment details and return policy

Seller information

pointmansurplus01

(159 🏚) 👚 Power Seller

Feedback Score: 159
Positive Feedback:
99.4%

Member since Jun-10-04 in United States

Nead feedback comments

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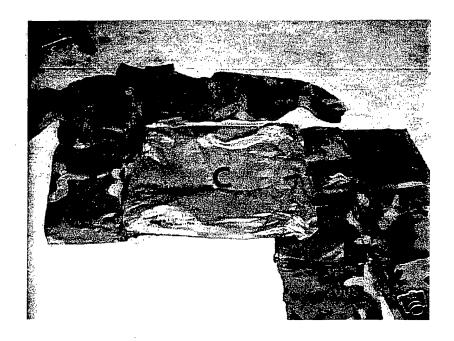
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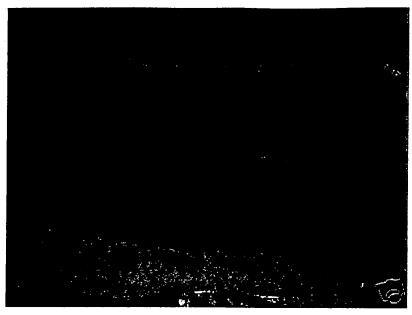


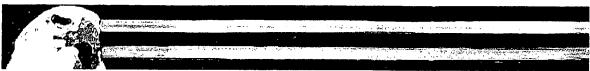




YOU ARE BIDDING ON A GI ISSUED WOODLAND CAMO CHEMICAL PROTECTIVE SUIT. NEW IN SEALED PACKAGE. PANTS AND SHIRT/JACKET. THESE ARE THE SAME CHARCOAL LINED SUITS THAT OUR TROOPS USE TO PROTECT FOR NBC, NUCLEAR, BIOLOGICAL, AND CHEMICAL ATTACKS. MADE BIG TO FIT OVER UNIFORMS. GREAT FOR HUNTING. CHARCOAL HIDES YOUR SCENT FROM ANIMALS.







00003 FREE Counters and Services from Andale

Shipping, payment details and return policy

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Services Available

Available to

US \$9.95

Standard Flat Rate Shipping Service

United States Only

Will ship to United States.

Shipping insurance

Not offered

Seller's payment instructions

IF NOT COMPLETELY SATISFIED THAT PRODUCT IS AS DESCRIBED, WILL REFUND, EXCLUDING THE FEES. CALL WITH QUESTIONS 843-270-1357

Payment methods accepted

This seller, pointmansurplus01, prefers PayPal.



Money order/Cashiers check
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Ready to bid?

GI ISSUED MILITARY WOODLAND CAMO CHEMICAL SUIT MEDIUM

Starting bid:

US \$19.95



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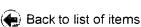
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Listed in category: Collectibles > Militaria > 1976-89

FBuy It Now price: US \$25.00

New U.S. Gl Military Chemical Suit LG Scent lock

Sell

Item number: 6514007996

Seller information

put-and-take (3542 🛊)

Feedback Score: 3542

Member since Dec-14-

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Positive Feedback:

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Help

Starting bid:

US \$18.00

Community

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Time left:

4 days 19 hours

7-day listing, Ends

Mar-01-

05 06:30:01 PST

Start time:

Feb-22-

05 06:30:01 PST

History:

1 of 6

Item location:

Boonville, Indiana

0 bids

United States

Ships to:

United States

Shipping costs: US \$5.00 -

Standard Flat Rate Shipping Service

(within

United States)

Shipping, payment details and return policy

Description

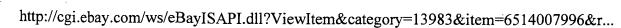
Supersize

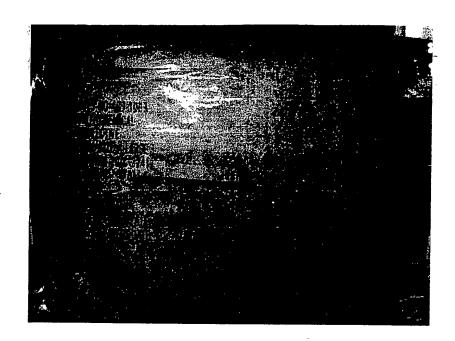
Brand New in the factory wrapper! size Large! inseam about 32". Both coat and pants incl. Charcoal lin cotton color. Great for deer hunting. "The buyer entered the following message: This is my 2nd suit pur first time I wore the suit I previously bought, I shot an 8pt buck. He never knew where I was, the suit w Please allow 5.00 S&H.

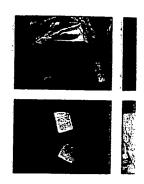
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Standard Flat Rate Shipping Service

United States Only

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Shipping insurance

Not offered

Payment methods accepted

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 Money order/Cashiers check Learn about payment methods.

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New U.S. GI Military Chemical Suit LG Scent lock

Place a Bid

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Buy It Now

Starting bid:

US \$18.00

FBuy It Now price: US \$25.00

Your maximum bid: US \$

(Enter US \$18.00 or more)

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Place Bid >

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step.

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eBay item 6514007996 (Ends Mar-01-05 06:30:01 PST) - New U.S. GI Military Chemica... Page 3 of 3

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Military Chemical Suits

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Next Page 图 Topic 图 **Author** Page: 1 of 2 dlust Posted - 11/04/2004: 07:29:24 Junior Member I read that these suits use the same charcoal prinicipal as more expensive scent controlling suits. I found some online for under \$20. Some of them it 335 Posts says that you aren't supposed to wash and others say heat up to activate. I would like to know of any personal experience before I buy some. I read a page full of user reviews and about 98% were nothing but positives. dlust dlust B Posted - 11/04/2004: 07:52:51 Junior Member anybody? MS 335 Posts dlust 倡 Sneek Posted - 11/04/2004: 07:59:40 Junior Member What website can they be found at? MS 162 Posts 倡 P dlust Posted - 11/04/2004: 08:08:49 3 Junior Member I think sportsmanguide.com but if you do a search on any search engine MS and just type military chem. suits you can find many sites. 335 Posts dlust 倡 dlust \mathbb{R}^{\prime} Posted - 11/04/2004: 08:13:23 Junior Member Sportsmanguide.com has them for under 20. MS 335 Posts dlust 個 **PMAN** Posted - 11/04/2004: 08:18:08

Junior Member

268 Posts

Dlust - back in the 80's and early 90's when I was in my Army days, these were called mop suits. they were charcoal based and very hot to wear. Which could work out nice on a cold morning. They were supposed to be onetime use for chemical protection. When you put a new one for the first time, you looked like you were a coal mine worker. black stuff all over you when you took it off. I guess i'm rambeling. To get to your point, yes they were charcoal (I dont know what they are now. I'm sure the military has made some type of modification since then) based. I would wash it. I probablly will work.

If you ain't hunting, you might as well go fishing!

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dlust

Junior Member

B Posted - 11/04/2004: 08:20:24

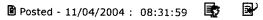


MS 335 Posts My father in law is in the air guard and says that he might be able to get me some that are close to the end of their shelf life. I believe that they are still charcoal but dont get you all black after you wear them. seems like a much cheaper alternative.

dlust

Flyin_Grebel

New Member



MS 67 Posts I bought one online a while back. It's coarse material, not comfortable, but seems like it ought to work. It has a charcoal liner like the commercial suits today, did not get me black when I put it on, should work fine. Unfortunately it does not fit me well enough to be comfortable (the online source did not have my size so I went one smaller---which I can usually wear---should have gone one larger).

Bottom line, not comfortable to hunt in, not quiet to move in, but should be at least somewhat effective at scent reduction. But you're probably better off in a comfortable pair of coveralls kept clean with scent-free soap, hung outdoors for a few days, then stored with a couple handfulls of pine needles. IMHO.



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dlust

Junior Member

Posted - 11/04/2004: 08:33:50



MS 335 Posts thanks Flyin_Grebel

comfort was my concern. i hate to buy clothing online that is why i was hoping my father in law could get me a set.

dlust

<u>dlust</u> Junior Member

D Posted - 11/04/2004: 10:17:14



MS 335 Posts I really want a scent proof suit mostly just to make me feel a little more confident. I go to measures that my wife laughs at. she thinks that everything is a sales gimmick. but i would love to have that extra insurance incase i miss something.

diust

dwayneensign Average Member

Posted - 11/04/2004: 10:25:22



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MS 742 Posts My opinion is if they sell for \$20, they are not even close to being the same thing as ScentLok and ScentBlocker suits. If they were, the price would be much higher. My suggestion would be to either buy a commercial carbon suit, including the head cover, or forget it altogether. By the way, my experience with the commercial carbon suits have been all positive. I have not had a single deer stand downwind of me and blow since I started wearing them. I have a lightweight (Savana) coverall, a ScentBlocker outer shirt, and a ScentLok underliner. I have two headcovers and one set of gloves. I store them in a Tinks carbon sack. Last year, I bought the outer shirt and gloves after the season at Wal Mart at 50% off. I also noticed most of the mail-order companies offer the carbon clothing at reduced prices after the season. I will probably stock up this year when they go on sale.

gadawg31 Starting Member

Posted - 11/04/2004: 13:44:19



MS 2 Posts

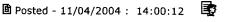
dlust, I've been in the military for 18 years and have used plenty of the old mop suits. The reason they are so cheap, is because they are so abundant and no-one wants them. Now that the carbon fad is coming on strong with the hunting community, you will see hunters like yourself finding these products and I'm sure the sellers will soon see an increase in their popularity and possibly raise the price. Any local Army/Navy surplus will have them and they work just as good as the expensive commercial stuff. I do recommend washing them atleast a couple of times, if you buy some still in the package. Now what you want is the new DCU chem suit, but I promise they won't be as cheap. Hope this helps.

BV

gadawg



Junior Member





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MS 335 Posts what does the dcu stand for?

Posted - 11/05/2004: 06:48:05

dlust

dan10226

Junior Member



LA 222 Posts

Activated charcol suits are all the same. The military suits are for protection from chemical attacts and only have a short shelf life to soak up chemicals. As long as the charcol is still intact it should absorb human odor.Remember the charcol will only absorb a certair amount of odor so do not use cover sents because it will absorb that scent and loose its effectiveness to absorb human odor. I have a set of British Chem.and wash after each hunt on gental cycle and dry on high heat to reactivate the carbon. They are warm so not any good during bow season, but good during gun season. Three years ago I killed a 230 lb 10 point that I stalked to within 25 yds and he was down wind hooking and he never knew I was

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there.

<u>dlust</u>

Junior Member

🖹 Posted - 11/05/2004 : 11:52:56 🔯 🖪

MS 335 Posts dan,,,how warm are they? how cool does it have to be to wear them comfortably?

dlust

<u>Ohnonotagain</u>

Starting Member

🖹 Posted - 11/05/2004: 18:28:54

MS 40 Posts DCU stands for desert camo uniform.

Take it from someone who has spent quite a bit of time in the Chemical warefare suite or MOPP gear, it is very heavy and uncomfortable. It will leave you black as tar and if you try to put it in your washer or dryer you will now longer be married, if you are. That stuff is LOADED with charcol. It would take 10 to 15 washings and it would still leave a little black on you. I am sure they would be effective for hunting and yes I have some today, but I will never use them, unless of course biological or chemcial warfare were an immediate threat. I guess the best answer I could give you, if you are that intrigued, buy them and put them on, I doubt you wear them more than once or twice.

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Hope that helps and good luck to all this weekend with our cool weather.

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Mississippi Wildlife Forums

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Snitz Forums 2000



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dan10226 Junior Member

Posted - 11/05/2004: 19:11:31

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222 Posts

dlust; They do not alow air circulation. If the temp gets around 65 or higher they do tend to get a little warm. They are designed with velcro closures at the cuffs and leg cuffs to keep chemicals out that also keeps heat in and the odor is absorbed by the charcol.

dan10226 Junior Member

Posted - 11/15/2004: 19:42:26



LA 222 Posts On Sat morning had two does 15 yds down wind while wearing my 3year old british chemical suit and they did not wind me.I had the flap covering the zipper open and unzipped about 4". When I drew my bow the velcro on my release caught on the velcro on the flap and off to the races they went. My new set should be in tomorrow. \$21.95 deliverd to the door. Not bad for new camo iff the charcol didn't work but it does

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dlust

Junior Member

B Posted - 11/16/2004: 07:37:41



MS

LA

335 Posts

where did you order it from?

dlust

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dan10226

Junior Member

222 Posts

B Posted - 11/17/2004: 06:53:26



WWW.SPORTSMANSGUIDE.COM go to government surplus type in chemical suit it will take u to two suits . the american is just a sooped up rain suit. The British suit is the real deal. Charcol lined. My new suit came in 11-16-04 still vacume pack . Card showed they were dated 9-91. \$14.97 + \$6.98 shipping. Stock #

WX2-36738-000-003-L this is large size, they only have large and small.



dlust Junior Member

Posted - 11/17/2004: 08:14:18



MS 335 Posts that sucks, i need at least an extra large. maybe i can find one

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dlust

<u>mnbob</u>

Starting Member

🖻 Posted - 11/18/2004: 16:45:37 🛚 🐯

MN 2 Posts gadawg31 i am doing a research paper on the development of scents and odor control from the 1960s to the present. i was interested in your knowledge of the chemical suits. when you might have used them and where you would have purchased them from in the 1980s. any information that you or anyone else can share with me would be greatly appreciated mnbob

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mnbob Starting Member

🖻 Posted - 11/24/2004: 09:37:58

MN 2 Posts THANKS FOR THE REPLY FROM GADAWG. THAT WAS VERY HELPFUL HOPEFULLY PMAN WILL ALSO REPLY AND PROVIDE SOME ADDITIONAL INFORMATION. ANYONE ELSE WITH SOME INFORMATION CONCERNING ODOR CONTROL IN THE 80'S I WOULD APPRECIATE HEARING FROM. THANKS MNBOB

rakkadoc 95 Starting Member

Posted - 11/26/2004: 10:45:50

MS 15 Posts

They are still charcoal! I am going on 15 years now and I still to this day hate wearing one, but do on occasion when I am bow hunting. They work just as good as the 200 to 300 dollar jobs.

Timothy M. Brady

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Mississippi Wildlife Forums

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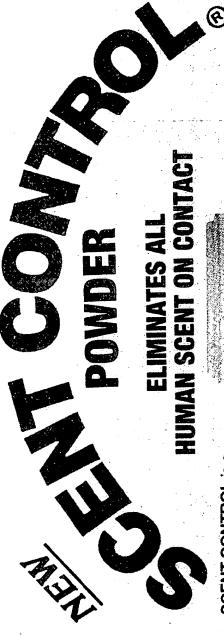


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10/713,686 Odor abs	orbing article of clothing	
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Application Number:	10/713,686	Custom
Filing or 371 (c) Date:	11-14-2003	Status:
Application Type:	Utility	Status [
Examiner Name:	HALE, GLORIA M	Locatio
Group Art Unit:	3765	Locatio
Confirmation Number:	4338	Earliest
Attorney Docket Number:	073328-0156	Earliest
Class / Subclass:	002/243.100	Patent 1
First Named Inventor:	Gregory Sesselmann , Muskegon, MI	Issue Da
Title of Invention:	Odor absorbing article of clothing	

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adsorbs and "locks up" body and nhibits new body odor formation and detected by game animals. nolecular level to prevent them n addition, SCÉNT CONTROL rom being released into the air than any liquid scent eliminator powder that deodorizes better SCENT CONTROL instantly other types of odors at the which results in prolonged SCENT CONTROL is a unique, high performance odor protection.

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